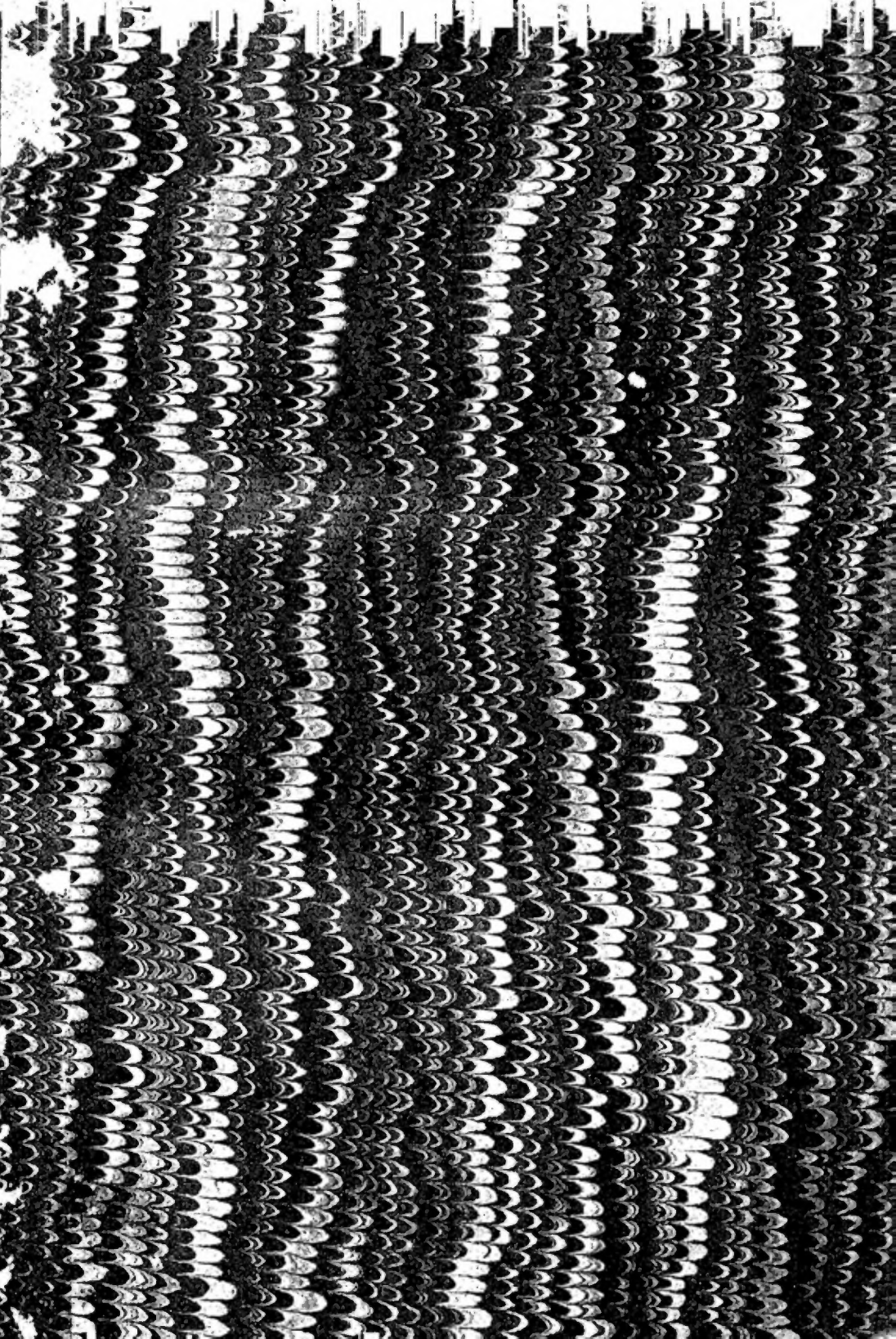


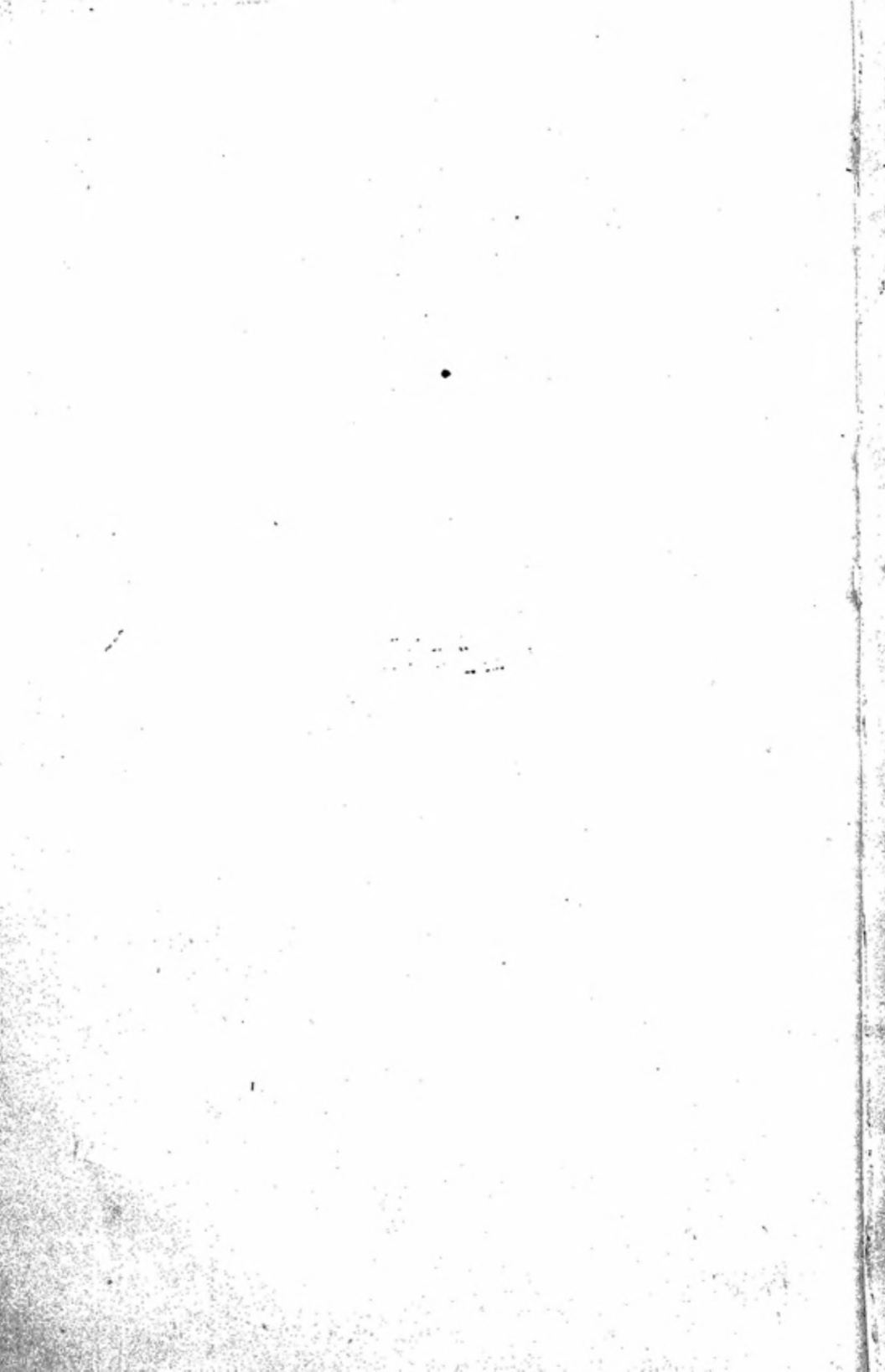
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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL.

EDITED BY

THE HONORARY SECRETARIES.



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JANUARY TO DECEMBER,

1873.

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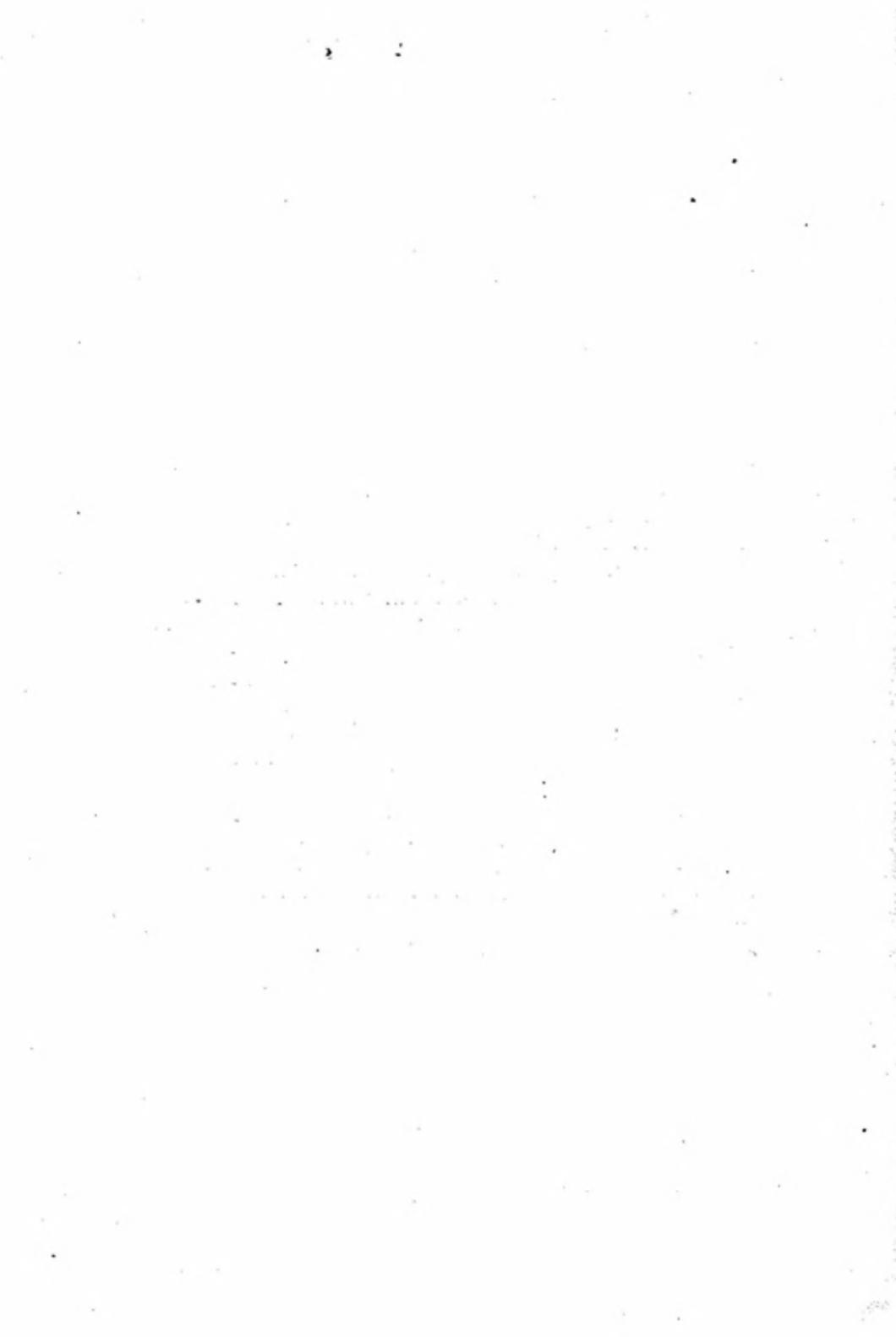
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CONTENTS.

	<i>Page</i>
List of Members of the Asiatic Society of Bengal on the 31st December, 1872, Appendix in February Proceedings,	I
Abstract Statement of Receipts and Disbursements of the Asiatic Society of Bengal for the year 1872, Appendix in February Proceedings,	XVII
Proceedings for January, 1873,	1-26
Do. for February, including Annual Report and Presi- dent's Address,	27-74
Do. for March, 1873,	75-86
Do. for April, "	87-92
Do. for May, "	93-120
Do. for June, "	121-135
Do. for July, "	137-152
Do. for August, "	153-170
Do. for November, "	171-194
Do. for December, "	195-207
Index,	209
Meteorological Observations for January to December, 1873.	



APPENDIX.

LIST OF MEMBERS
OF THE
ASIATIC SOCIETY OF BENGAL,
ON THE 31ST DECEMBER, 1872.

LIST OF ORDINARY MEMBERS.

The * distinguishes Non-Subscribing, the † Non-Resident Members,
and the ‡ Life-Members.

N. B.—Gentlemen who may have changed their residence, since this list was drawn up, are requested to give intimation of such a change to the *Secretaries*, in order that the necessary alterations may be made in the subsequent edition. Errors or omissions in the following list should also be communicated to the *Secretaries*.

Gentlemen who are proceeding to Europe, with the intention of not returning to India, are particularly requested to notify to the *Secretaries*, whether it be their desire to continue as members of the Society, otherwise, in accordance with rule 14 B. of the Bye-laws, their names will be removed from the list at the expiration of three years from the time of their leaving India.

Date of Election.			
1860 Dec.	5.	Abdullatif Khán Bahádur, Maulavi.	Calcutta
1868 Sept.	2.	†Adam, R. M., Esq.	Sambhar Lake, viâ Jaipur
1869 Jan.	20.	*Adley, C. C., Esq., C. E., Nerbudda Coal & Iron Co.	Europe
1860 July	4.	†Ahmad Khan, Sayyid, Bahádur.	Benares
1872 April	3.	†Ahsanullah Khwajah.	Dacca
1860 April	4.	†Aitchison, J. E. T., Esq., M. D.	Ludiánah
1866 Jan.	17.	Allan, Lieut-Col. A. S.	Calcutta
1869 Oct.	6.	*Allardyce, A., Esq.	Europe
1871 June	7.	†Alexander, J. W., Esq.	Benares
1860 Oct.	3.	Amir Alf Khán, Bahádur, Munshi.	Calcutta
1865 Jan.	11.	Anderson, Dr. J., F. L. S.	Calcutta
1872 June	5.	Anderson, A. Esq.	Futtehghur
1861 Sept.	4.	*Asghar Ali Khán Bahádur, Nawáb.	Europe
1869 Feb.	3.	Ashton, Rev. J. P.,	Calcutta
1871 Sept.	6.	†Atkinson, E. T., Esq., C. S.	Allahabad
1855 July	4.	Atkinson, W. S., Esq., M. A., F. L. S.	Calcutta
1869 Feb.	3.	†Attar Singh Bahádur, Sirdár.	Loodiana
1870 Feb.	2.	†Baden, Powell H., Esq., C. S.	Lahore
1859 Aug.	3.	Baláichánd Síinha, Bábu.	Calcutta
1865 Nov.	7.	†Ball, V., Esq., Geol. Survey.	Geol. S. Office
1860 Nov.	1.	Banerjea, Rev. K. M.	Calcutta
1869 Dec.	1.	†Barker, R. A., Esq., M. D.	Beerbhoom
1856 Sept.	3.	Bashiruddin, Sultán, Muhammad.	Chinsurah
1869 Feb.	3.	†Baxter, J. B., Esq., M. R. C. S.	Calcutta
1859 May	4.	Bayley, E. C., The Hon'ble, B. C. S., C. S. I.	Calcutta
1861 Feb.	6.	†Bayley, S. C., Esq., B. C. S.	Patna
1864 Sept.	7.	†Beames, J., Esq., B. C. S.	Balasore

Date of Election.		
1841 April 7.	Beaufort, F. L., Esq., B. C. S.	Calcutta
1867 July 3.	†Belletty, N. A., Esq.	Mymensing
1869 Jan. 20.	†Bellew, Dr. P. F.	Bombay Mint
1871 March 1.	Benedict, E., Esq., C. E.	Calcutta
1862 Oct. 8.	Bernard, C. E., Esq., B. C. S.	Calcutta
1872 Aug. 7.	Beverley H., Esq., C. S.	Calcutta
1862 June 4.	†Bhau Daji, Dr.	Bombay
1864 Nov. 2.	Bhudeva Mukerjea, Bábu.	Chinsurah
1872 Nov. 6.	Bisset, Lieut. W. S. S., R. E.	Calcutta
1857 Mar. 4.	Blanford, H. F., Esq., A. R. S. M., F. G. S.	Calcutta
1859 Aug. 3.	†Blanford, W. T., Esq., A. R. S. M., F. G. S., Geol. Survey.	Europe
1864 April 6.	Blochmann, H., Esq., M. A.	Calcutta
1871 April 5.	†Bourne, T. W., Esq.	Central Pro- vinces
1872 June 5.	†Bourne, Lieut. J. H.	Shillong
1871 April 5.	†Bourne, Walter, Esq., C. E.	Madapoor
1868 Jan. 15.	Boxwell, J., Esq., C. S.	Serampore
1860 March 2.	†Brandis, Dr. D.	Europe
1870 Aug. 3.	*Broadley, A. M., Esq.,	Europe
1872 June 5.	†Brooks, W. E., Esq., C. E.	Assensole
1871 Jan. 4.	Brough, R. S., Esq.	Calcutta
1866 Jan. 17.	†Brown, Col. D.	Moulmein
1866 Nov. 7.	†Browne, Lieut.-Col. Horace A.	Thayetimo
1866 June 6.	†Brownfield, C., Esq.	Kamrup
1868 June 3.	†Buck, E. C., Esq., C. S.	Cawnpur
1871 July 5.	†Buckland, C. T., Esq., C. S.	Burdwan
1866 June 6.	†Buckle, Dr. H. B., C. B.	Dacca
1871 Sept. 6.	†Buckle, H., Esq.	Akyab
1872 Jan. 3.	*Butcher, W. D., Esq., M. R. C. S.	Europe
1869 Jan. 20.	†Cadell, A., Esq., B. A., C. S.	Muzaffarnagar
1863 June 3.	Campbell, The Hon'ble G.	Calcutta
1860 Jan. 3.	*Carnac, J. H. Rivett, Esq., B. C. S.	Europe
1868 Aug. 5.	†Chandramohan, Gosvámi, Pandit.	Gowhati
1863 Aug. 5.	†Chandranáth Ráy, Rája.	Nator
1871 Sept. 6.	†Chisholm, R. F., Esq.	Madras
1868 Feb. 5.	†Clark, Major E. G., Bengal Staff Corps.	Kherce Oudh
1871 March 1.	†Clarke, C. B., Esq.	Dacca
1872 Aug. 7.	†Clutterbuck, Capt. F. St. Quintin.	Attock
1868 Nov. 4.	*Cole, Lieut. H. H., R. E.	Europe
1862 April 2.	Colles, J. A. P., Esq., M. D.	Calcutta
1871 Oct. 4.	†Cooke H. G., Esq., C. S.	Chittagong
1868 Dec. 2.	†Cooke, J. E., Esq.	Haidarabad
1870 June 1.	Couch, The Hon'ble Sir R.	Calcutta
1872 June 5.	*Court, Major M. H.	Europe
1858 March 4.	*Cowell, E. B., Esq., M. A.	Europe
1871 April 5.	Curtoys, W. J., Esq.	Calcutta

Date of Election.			
1847 Juno	2.	†Dalton, Col. E. T., C. S. I., Staff Corps.	Chota Nagpur
1870 May	4.	†Damant, G. H., Esq., C. S.	Dinajepore
1861 March	6.	Davey, N. T. E., Revenue Survey.	Howrah
1861 Nov.	6.	†Davies, The Hon'ble R. H., C. S. I., B. C. S.	Lahore
1869 April	7.	†Day, Dr. F., F. L. S., F. Z. S.	India
1856 June	4.	†DeBourbel, Major R., Royal Engrs.	Oudh
1870 Feb.	2.	†DeFabeck, F. W. A., Esq., B. M. Servico.	Jaipur
1872 Aug.	7.	Dejoux, P., Esq.	Calcutta
1869 Oct.	6.	†Delmerick, J. G., Esq.	Delhi
1864 July	6.	Devendra Mallik, Babu.	Calcutta
1862 May	7.	†Dhanapati Singh Dughar, Ráy Bahádur.	Azimganj
1853 Sept.	7.	Dickens, Col. C. H., C. S. I.	Calcutta
1871 March	1.	Dijendranath Thakur, Babu.	Calcutta
1870 May	4.	Dobson, G. E., Esq., B. A., M. B.	Calcutta
1859 Sept.	7.	†Douglas, Col. C.	Meerut
1869 Feb.	3.	*Draw, F., Esq.	Europe
1870 March	8.	†Duke of Edinburgh, His Royal Highness.	Europe
1867 June	5.	*Duthoit, W., Esq., C. S.	Europe
1868 Oct.	7.	†Eddowes, W., Esq., M. D.	Erinpur
1863 May	6.	Edgar, J. W., Esq., B. C. S.	Calcutta
1865 Feb.	1.	*Egerton, Ph., Esq., B. C. S.	Europe
1846 Jan.	7.	†Elliot, Sir Walter, late M. C. S.	Europe
1859 Nov.	2.	†Elliot, C. A., Esq., B. C. S.	Allahabad
1871 Oct.	4.	†Evezard, Col. G. E.	Poona
1863 Oct.	7.	Ewart, J., Esq., M. D.	Calcutta
1851 May	7.	*Fayrer, Dr. J., C. S. I.	Europe
1863 Jan.	15.	†Fedden, Francis, Esq., Geol. Survey.	Geol. S. Office
1868 May	6.	†Field, C. D., Esq., M. A., C. S.	Chittagong
1869 Sept.	1.	†Fisher, J. H., Esq., C. S.	Raipore
1872 Dec.	4.	†Forbes, Major, J. G., R. E.	Lucknow
1867 April	3.	†Ford, Lieut-Col. B.	Madras
1861 Feb.	6.	†Forest, R., Esq., Civil Engineer.	Dehra
1869 Oct.	12.	†Forlong, Lieut.-Col. J. G. R., M. S. C.	Lucknow
1863 June	3.	†Forsyth, T. D., Esq., C. B.	Oudh
1871 Nov.	1.	†Foster, J. M., Esq., M. R. C. P.	Europe
1869 Sept.	1.	†Fryer, Capt. G. E., Dy. Commissioner.	Sandoway
1859 Dec.	7.	Futteh Ali, Maulavi.	Calcutta
1867 Sept.	4.	†Fyfe, The Rev. W. C.	Europe
1849 Sept.	5.	*Fytche, Major Genl. A., C. S. I.,	Europe
1871 June	7.	Gangaprasad Sinha, Babu.	Calcutta
1871 Aug.	2.	†Gangaprasad, Munshi.	Moradabad
1859 Aug.	3.	Gastrell, Col. J. E., Supdt., Rev. Survey.	Calcutta
1862 Feb.	5.	Gauradás Basák, Bábu.	Calcutta
1867 Sept.	4.	†Gauvain, Capt. V.	Calcutta
1867 Dec.	4.	Gay, E., Esq., M. A.	Calcutta

Date of Election.		
1859 Sept.	7.	Geogheghan, J., Esq., B. C. S.
1869 Feb.	3.	†Giriprasād Singh, Thākūr.
1861 Feb.	6.	†Godwin-Austen, Major H. H., Topogra- phical Survey.
1869 Oct.	6.	†Gomes, A. D. B., Esq.
1872 Nov.	6.	†Gordon, C. B. P., Esq.
1862 July	2.	†Gordon, J. D., Esq., C. S. I., C. S.
1869 July	7.	†Gordon, Robert, Esq., C. E.
1871 March	1.	†Gough, A. E., Esq.
1871 March	1.	†Govindacoomar, Chaudhari.
1863 Nov.	4.	†Gowan, Lieut.-Col. J. Y.
1869 Oct.	6.	*Gray, R., Esq., M. B.
1867 June	5.	*Gregory, Capt. J.,
1866 June	6.	Gribble, T. W., Esq., B. C. S.
1861 Sept.	4.	†Griffin, L. H., Esq., B. C. S.
1860 Nov.	7.	†Griffith, R. T. H., Esq., M. A.
1861 Feb.	6.	†Growse, F. S., Esq., M. A., B. C. S.
1871 Jan.	4.	Gunendranath Thakur, Babu.
1864 Dec.	5.	†Gurucharan Dās, Bābu,
1871 June	7.	Habīburrāhmān, Maulavi.
1867 July	3.	†Hacket, C. A., Esq., Geol. Survey.
1869 April	3.	†Hæberlin, The Rev. C.
1866 Jan.	17.	*Hamilton, Lieut.-Col. T. C.
1855 March	7.	†Hamilton, R., Esq.
1871 July	5.	Hamilton, Col. O.
1861 March	1.	†Harachandra Chaudhari, Babu.
1866 Nov.	1.	Harendra Krishna Bahādūr, Kumār.
1871 Feb.	1.	†Harkness, T. F., Esq., C. S.
1861 Feb.	6.	†Harrison, A. S., Esq., B. A.
1859 Oct.	12.	†Haughton, Col. J. C., C. S. I.
1862 Aug.	6.	Heeley, W. L., Esq., B. A., C. S.
1872 May	1.	Heigers, W., Esq.
1853 July	6.	*Herschel, W. J., Sir, Bart., B. C. S.
1868 Aug.	5.	†Hobart, R. T., Esq., C. S.
1872 Nov.	6.	†Holcombe, Lieut. W. A.
1872 Dec.	4.	†Hoernle, Rev. A. F. R., Ph. D.
1868 Nov.	4.	*Holroyd, Capt. W. R. M.
1863 Jan.	15.	*Howell, M. S., Esq., C. S.
1871 April	5.	*Howell, A. P., Esq., C. S.
1866 Feb.	7.	Hoyle, G. W., Esq.
1867 Aug.	7.	†Hughes, T. H., Esq., A. R. S. M., F. G. S. Geol. Survey of India.
1866 Jan.	17.	†Hughes, Captain W. G., M. S. C.
1870 Jan.	5.	Hume, Allan O., Esq., C. B., C. S.
1870 June	1.	Hunter, W. W., Esq., LL. D., C. S.
		Calcutta
		Allighur
		East-Assam
		Sunderbuns
		Berhampore,
		Gaujam
		Mysore
		Henzaday
		Benares
		Dacca
		Allahabad
		Europe
		Europe
		Calcutta
		Lahore
		Benares
		Muttra
		Calcutta
		Backergunge
		Calcutta
		Geol. S. Office.
		Ranchee
		Europe
		Wurdah
		Calcutta
		Mymensing
		Calcutta
		Azamgarh
		Muir's College,
		Allahabad
		Kooch Behar
		Calcutta
		Calcutta
		Europe
		Etah
		Manblhūm
		Benares
		Europe
		Europe
		Europe
		Calcutta
		Geol. S. Office
		Arracan
		Calcutta
		Calcutta

Date of Election.		
1868 April, 1.	Hyde, Lieut.-Col. H., R. E.	Calcutta
1869 Sept. 1.	*Hyde, E., Esq.	Europe
1872 Dec. 4.	*Ibbetson, D. C. J. Esq., C. S.	Europe
1870 April 6.	*Innes, F. W., Esq., M. D., C. B.	Europe
1866 March 7.	*Irvine, W., Esq., C. S.	Europe
1862 Oct. 8.	†Irwin, Valentine, Esq., C. S.	Cuttack
1871 March 1.	Isaac, T. S. Esq., C. E.	Calcutta
1853 Dec. 7.	†Isvariprasád Singh Bahádur, Rájá.	Benares
1865 June 7.	†Jaykissen Dás Bahádur, Rájá, C. S. I.	Allighur
1866 Feb. 7.	†Johnson, W. H., Esq.	Sialkote
1862 March 5.	†Johnstone, Major J. W. H., Dy. Commis- sioner.	Bunnoo, Panjab
1867 Dec. 4.	†Johnstone, Capt. J.	Europe
1869 April 7.	Kabiruddin Ahmad, Maulavi	Calcutta
1871 May 3.	Kaliprasan Ghosh Babu.	Calcutta
1861 Dec. 4.	Kempson, M., Esq., M. A.	Bareilly
1867 Dec. 4.	*King, G., Esq., M. B.	Europe
1867 March 6.	†King, Capt. H. W.	P. & O. Co's Office
1862 Jan. 15.	†King, W., Jr., Esq., Geol. Survey of India.	Geol. Surv. O.
1867 March 6.	†Knox, G. E., Esq., C. S.	Allahabad
1860 May 5.	Kurz, S., Esq.	Calcutta
1869 Sept. 1.	*Latham, G., Esq., C. E.	Europe
1852 April 7.	*Lees, Lieut.-Col. W. N., LL. D.	Europe
1868 Feb. 5.	*Lees, L. H., Esq., M. D.	Europe
1859 Dec. 7.	Leonard, H., Esq., M. A.	Calcutta
1870 July 6.	Lethbridge, E., Esq., M. A.	Calcutta
1869 June 2.	*Leupolt, J. C., Esq., C. S.	Europe
1865 June 7.	†Lewin, Capt. T. H.	Chittagong
1864 Nov. 2.	Locke, H. H., Esq.	Calcutta
1869 April 7.	†Lockwood, E. D., Esq., C. S.	Monghyr
1866 Jan. 17.	†Low, J. Esq., G. T. S.	Almora
1869 July 7.	†Lyall, C. J., Esq., B. A., C. S.	Allahabad
1870 April 6.	†Lyman, B. Smith, Esq.	America
1868 Dec. 2.	*Macauliff, M., Esq., B. A., C. S.	Europe
1866 June 6.	Macdonald, Major J., Staff Corps.	Calcutta
1848 April 5.	†Maclagan, Col. R., R.E., F.R.S.E., F.R.G.S.	Lahore
1867 July 3.	Macnamara, Dr. C.	Calcutta
1870 May 4.	†Macnaghten, C., Esq.	Rajkote College, Kattywar
1867 April 3.	Mahendralál Sircár, Dr.	Calcutta
1867 April 3.	†Mainwaring, Lieut.-Col. G. B.	Darjeeling
1862 Sept. 3.	†Mallet, F. R., Esq., Geol. Survey.	Geol. S. Office
1852 Nov. 3.	Manickjee Rustamjee, Esq.	Calcutta

Date of Election.		
1872 Nov. 6.	†Man, E. H., Esq.	Port Blair
1869 July 7.	†Markham, A. M., Esq., C. S.	Nynce Tal
1860 March 7.	†Medlicott, H. B., Esq., F. G. S., Geol. Survey of India.	Geol. S. Office
1871 Sept. 6.	†Miles, Capt. S. B.	Bombay
1870 July 6.	Miller, A. B., Esq.,	Calcutta
1867 June 5.	Milman, R., D. D., The Right Rev. Lord Bishop of Calcutta.	Calcutta
1867 March 6.	†Montgomerie, Major T. G., R. E.	Dera Doon
1854 Dec. 6.	†Morris, G. G., Esq., B. C. S.	Backergunj
1854 Oct. 11.	†Muir, Sir W., K. C. S. I., B. C. S.	Allahabad
1862 July 2.	†Napier of Magdala, Lord R., General, G. C. S. I., G. C. B.	India
1871 Oct. 4.	* Neil, Dr. A.	Europe
1869 May 5.	Nevill, G., Esq., C. M. Z. S.	Calcutta
1865 Feb. 1.	†Newal Kishwar, Munshi.	Lucknow
1870 Feb. 5.	†Newman, J. H., Esq., M. D.	Ajmere
1871 Jan. 4.	*Newton, Isaac, Esq.	Europe
1872 May 1.	†Niranjan Mukerji, Babu.	Benares
1869 July 7.	†Nursing Rao, A. V., Esq.	Vizagapatam
1871 July 5.	†Oates, E. W., Esq., C. E.	Thayetmyo
1851 June 4.	Oldham, T., Esq., LL. D., F. R. S.,	Calcutta
1867 Aug. 7.	*Oldham, R. A., Esq., C. E.	Europe
1864 Mar. 2.	Palmer, Dr. W. J.	Calcutta
1862 May 7.	*Partridge, S. B., Esq., M. D.	Europe
1871 Dec. 6.	†Peal, S. E., Esq.	Sibsagar, Assam
1867 Mar. 6.	Pearimohan Mukarji, M. A., Bábú.	Uttarparah
1860 Feb. 1.	†Pearse, Lieut-Col. G. G.	Europe
1868 Nov. 4.	†Pearson, C. E.	Rawal Pindi
1869 July 7.	Pell, S., Esq.	Calcutta
1864 Mar. 2.	Pellew, F. H., Esq., C. S.	Hooghly
1865 Sept. 6.	†Peppé, J. H., Esq.	Ranchi
1868 May 6.	Peterson, F. W., Esq.	Calcutta
1835 July 1.	†Phayre, Major G., Sir A. P., K. C. S. I., C. B.	Europe
1864 Nov. 2.	Phear, The Hon'ble J. B.	Calcutta
1869 Feb. 3.	†Pickford, J., Esq., M. A.	Madras
1868 April 1.	†Pramathanáth Ráy, Kumár.	Digapati
1872 Dec. 4.	Prananath Pandit, Babu.	Bhawani pore
1869 Feb. 3.	Pratápachandra Ghosha, B. A.	Calcutta
1871 June 7.	†Pratt, Capt. C. S., Staff-Corps.	Morar-Gwalior
1862 Oct. 8.	†Pulinavihúri Sen, Bábú.	Berhampore
1856 Mar. 5.	Rájendralála Mitra, Bábú	Calcutta
1868 Jan. 15.	†Rákhaldass Haldar, Bábú.	Ranchi
1871 June 7.	Rámakrishna Dás, Bábú.	Calcutta

Date of Election.		
1837 Feb.	1.	Ramánáth Thákur, The Hon'ble Raja.
1866 Jan.	17.	*Rattray, A., Esq.
1860 Mar.	7.	†Reid, H. S., Esq., C. S.
1871 July	5.	†Reid, J. R., Esq., C. S.
1872 April	3.	†Richard, Dr. V.
1868 April	1.	Robb, G., Esq.
1863 April	1.	†Robertson, C., Esq., C. S.
1865 Feb.	1.	Robinson, S. H., Esq.
1870 Dec.	7.	Rogers, A., Esq.
1871 May	3.	*Rogers, Capt. B.
1869 July	7.	†Ross, Lieut. J. C., R. E.
1870 Jan.	5.	†Ross, Alexander G., Capt. Staff Corps.
1871 April	5.	Rundall, Col. F. H.
1871 Dec.	6.	†Samuells, Capt. W. L.
1871 May	3.	Sanderson, C., Esq.
1872 Feb.	7.	†Sashagiri Sastri M. B. A.
1870 May	4.	Satyánand Ghoshál, Rája.
1864 June	1.	*Saunders, J. O'B., Esq.
1854 Dec.	6.	†Saxton, Col. G. H., F. G. S., M. S. Corps.
1870 May	4.	†Schlich, Dr. W.
1869 Feb.	3.	Schwendler, L., Esq.
1860 July	4.	†Shelverton, G., Esq.
1863 April	1.	†Showers, Lieut.-Col. C. L.
1866 June	6.	†Sime, J., Esq., B. A.
1872 Aug.	7.	†Skrefsrud, Rev. L. O.
1864 Sept.	7.	†Sladen, Major E. B.
1866 June	6.	†Smart, R. B., Esq., Rev. Survey.
1865 July	5.	Smith, D. Boyes, Esq., M. D.
1868 April	1.	Smith, McLaren W., Esq.
1854 Sept.	6.	†Spankie, The Hon'ble R., B. C. S.
1864 Mar.	2.	†Spearman, Capt. H. R.
1867 May	1.	†Steel, Capt. E. H., R. A.
1872 July	3.	†Stephen, Carr, Esq.
1863 Sept.	2.	†Stewart, R. D., Esq.
1864 April	6.	†Stewart, J. L., Esq., M. D.
1870 April	6.	Stewart, R., Esq.
1870 Sept.	7.	†St. John, R. T., Esq.
1861 Sept.	4.	Stokes, Whitley, Esq.
1863 Nov.	4.	Stoliczka, F., Esq., Ph. D., F. G. S.,
1843 May	3.	*Strachey, Major General, R., C. S. I., C.B.
1869 Feb.	3.	*Strachey, The Hon'ble Sir J., K. C. S. I.
1859 Mar.	2.	†Stubbs, Major F. W., Royal Artillery.
1858 July	7.	†Sutherland, H. C., Esq., B. C. S.
1872 Dec.	4.	†Swetenham, Capt. E.
1864 Aug.	11.	Swinhoe, W., Esq.
1863 Sept.	3.	Syámácharan Sarcár, Bábu.
		Calcutta
		Europe
		Allahabad
		Azinghur
		Balasore
		Calcutta
		Mirzapur
		Calcutta
		Calcutta
		Europe
		Boolundshuhur
		Edwardesabad
		Calcutta
		Hazareebaugh
		Calcutta
		Madras
		Calcutta
		Europe
		Ootacamund
		Calcutta
		Calcutta
		Waltair, near
		Vizagapatam
		Umballa
		Delhi
		Rampur Haut
		Amherst
		Raepur, C. P.
		Calcutta
		Calcutta
		Allahabad
		Prome
		DeraGhaziKhan
		Delhi
		Serajgunj
		Panjab
		Calcutta
		Akyab
		Calcutta
		Calcutta
		Europe
		Europe
		Lueknow
		Sylhet
		Prome
		Calcutta
		Calcutta

Date of Election.		
1865 Sept.	6.	Tawney, C. H., Esq., M. A.
1865 April	5.	†Taylor, R., Esq.
1860 May	2.	Temple, The Hon'ble Sir R., K. C. S. I., B. C. S.
1859 Mar.	2.	†Theobald, W., Esq., Geological Survey.
1869 Oct.	6.	†Thomson, A., Esq.
1863 Mar.	4.	*Thompson, Major G. H., Bengal Staff Corps.
1863 June	4.	*Thornton, T. H., Esq., D. C. L., C. S.
1847 June	2.	Thuillier, Col. H. L., Royal Artillery, F. R. S., C. S. I.
1865 July	5.	†Tolbort, T. W. H., Esq., C. S.
1865 July	5.	Tonnerre, Dr. C. F.
1871 April	5.	Trefftz, Oscar, Esq.
1861 June	5.	†Tremlett, J. D., Esq., M. A., C. S.
1872 July	3.	Trevor, W. S., R. E.
1861 Sept.	4.	Tween, A., Esq., Geological Survey.
1863 May	6.	*Tyler, Dr. J.
1869 June	2.	†Udayachand Datt, Bábú.
1868 Sept.	2.	Van Cutsem, E. Ch. Esq.
1860 May	2.	†Vanrenen, Major A. D., Bengal Staff Corps.
1864 Feb.	3.	†Verchère, A. M., Esq., M. D.
1864 April	6.	†Vijayarāma Gajapati Rāj Munniā Sultān Bāhadur, Mahārājah Mirza.
1870 June	1.	†Vrindāvanachandra Mandala, Bábú.
1871 Feb.	1.	†Waagen, Dr. W.
1869 Aug.	4.	Wahid Ali, Prince Jahān Qadr Muhanmad, Bahādur.
1865 Nov.	1.	Waldie, D., Esq., F. G. S.
1861 May	1.	†Walker, Col. J. T., R. E., F. R. S.
1863 Oct.	7.	Waller, W. K., Esq., M. B.
1862 Jan.	15.	†Ward, G. E., Esq., B. C. S.
1865 May	3.	Waterhouse, Capt. J., B. S. C.
1869 Sept.	1.	*Westland, J., Esq., C. S.
1867 Feb.	6.	*Westmacott, E. V., Esq., B. A., C. S.
1862 Oct.	8.	†Wheeler, J. T., Esq.
1867 Aug.	7.	†Wilcox, F., Esq.
1867 Jan.	16.	†Williamson, Lieut. W. J.
1867 Mar.	6.	Willson, W. G., Esq., B. A.
1871 Mar.	1.	†Willson, James, Esq., B. A.
1870 Aug.	3.	Wilson, R. H., Esq., C. S.
1866 Mar.	7.	†Wise, Dr. J. F. N.
1867 July	3.	†Wood, Dr. J. J.,
1870 Jan.	5.	Wood-Mason, J., Esq., F. G. S.
1851 May	7.	Woodrow, H., Esq., M. A.
1869 Sept.	1.	Yadulāl Mallik, Bábú.
		Calcutta
		Madras
		Calcutta
		B. Burma
		Faizabad
		Europe
		Europe
		Calcutta
		Bunnoo
		Calcutta
		Calcutta
		Moozuffergurh
		Calcutta
		Calcutta
		Europe
		Nowakhali
		Calcutta
		Moradabad
		Benares
		Vizianagram
		Balasore
		Europe
		Garden Reach
		Calcutta
		Dehra Doon
		Calcutta
		Furruckabad
		Calcutta
		Europe
		Europe
		Burma
		Purulia
		Garo Hills
		Calcutta
		Geol. Survey
		Calcutta
		Dacca
		Ranchi
		Calcutta
		Calcutta
		Calcutta

Date of Election.				
1868	June	3.	Yatendra Mohun Tagore, Rajah Bahádúr.	Calcutta
1467	Mar.	6.	†Yogendranáth Mallik, Bábu.	Andul

HONORARY MEMBERS.

Date of Election.				
1825	Mar.	9.	M. Garcin de Tassy, Memb. de l'Institut.	Paris
1821	"	6.	Sir John Phillippart.	London
1826	July	1.	Count de Noe.	Paris
1831	"	7.	Prof. C. Lassen.	Bonn
1835	May	6.	Prof. Lea.	Philadelphia
1842	Feb.	4.	Dr. Ewald.	Göttingen
1842	"	4.	Right Hon'ble Sir Edward Ryan, Kt.	London
1843	Mar.	30.	Prof. Jules Mohl, Memb. de l'Institut.	Paris
1847	Sept.	1.	Col. W. Munro.	London
1847	Nov.	3.	His Highness the Nawab Nazim of Bengal.	Murshidabad
1848	Feb.	2.	Dr. J. D. Hooker, R. N., F. R. S.	Kew
1848	Mar.	8.	Prof. Henry.	Princeton, U. S.
1853	April	6.	Major-Gen. Sir H. C. Rawlinson, K. C. B.	London
1858	July	6.	B. H. Hodgson, Esq.	Europe
1859	Mar.	2.	The Hon'ble Sir J. W. Colville, Kt.	Europe
1860	Mar.	7.	Prof. Max Müller.	Strassburg
1860	Nov.	7.	Mons. Stanislas Julien.	Paris
1860	"	7.	Dr. Robert Wight.	London
1860	"	7.	Edward Thomas, Esq.	London
1860	"	7.	Dr. Aloys Sprenger.	Bern
1860	"	7.	Dr. Albrecht Weber.	Berlin
1865	Sept.	6.	Edward Blyth, Esq.	Europe
1868	Feb.	5.	Genl. A. Cunningham, C. S. I.	India
1868	"	5.	Prof. Bápu Déva Sástri.	Benares
1868	"	5.	Dr. T. Thomson,	London
1868	"	2.	A. Grote, Esq., C. S.	London
1871	"	7.	C. Darwin, Esq.	London
1872	"	1.	Sir G. B. Airy.	London
1872	June	5.	Prof. T. Huxley.	London

CORRESPONDING MEMBERS.

1844	Oct.	2.	Macgowan, Dr. J.	Europe
1856	June,	4.	Kramer, Herr A. von,	Alexandria
1856	"	4.	Porter, Rev. J.	Damascus

Date of Election.				
1856	June	4.	Schlagintweit, Herr H. von.	Munich
1856	"	4.	Smith, Dr. E.	Beyrout
1859	"	4.	Tailor, J., Esq.	Bussorah
1856	"	4.	Wilson, Dr.	Bombay
1857	Mar.	4.	Neitner, J., Esq.	Ceylon
1858	Mar.	3.	Schlagintweit, Herr R. von.	Giesen
1859	Nov.	2.	Frederick, Dr. H.	Batavia
1859	May	4.	Bleeker, Dr. H.	Europe
1860	Feb.	1.	Baker, The Rev. H.	E. Malabar
1860	"	1.	Swinhoe, R., Esq., H. M.'s Consul.	Amoy
1860	April	4.	Haug, Dr. M.	Punah
1861	July	3.	Gösche, Dr. R.	Berlin
1862	Mar.	5.	Murray, A., Esq.	London
1863	July	4.	Barnes, R. H., Esq.	Ceylon
1866	May	7.	Schlagintweit, Prof. E. von.	Munich
1866	"	7.	Sherring, Rev. M. A.	Benares
1868	Feb.	5.	Foucaux, M. F. H.	Paris
1868	"	5.	Hölmboe, Prof.	Christiania

ASSOCIATE MEMBERS.

1835	Oct.	7.	Stephenson, J., Esq.	Europe
1838	Feb.	7.	Karāmat Ali, Sayyid.	Hooghly
1843	Dec.	6.	Long, Rev. J.	Europe
1865	May	3.	Dall, Rev. C. H.	Calcutta

LIST OF MEMBERS WHO HAVE BEEN ABSENT FROM INDIA THREE YEARS AND UPWARDS.*

Rule 14, A.—In the event of an Ordinary Member leaving India, and in the further event of his informing the Secretary by letter that he has no intention of returning, but desires to retain his privileges as an Ordinary Member, his subscription shall be 12 Rupees per annum, commutable into a single payment of Rs. 100, provided that if any such Member shall hereafter return to India, he shall thereupon become liable to pay his original subscriptions, subject to the operation of rule 10 B.

Rule 14, B.—After the lapse of three years from the date of a Member leaving India, if no intimation of his wishes shall, in the interval, have been received by the Society, his name shall be removed from the list of Members.

	<i>Date of Leaving India.</i>
Abbot, Major General J., R. A.	1868
Allan, C., Esq., B. C. S.	1857
Alabaster, C., Esq.	1860
Anderson, W., Esq.	1868
Anderson, Lieut.-Col. W. B.	1854
Asphar, J. J. T., Esq.	1862
Baker, Col. W. E., Bengal Engineers.	1857
Barry, Dr. J. B.	1864
Batten, J. H., Esq., B. C. S.	1866
Baynes, J., Esq.	1869
Beadon, The Hon'ble Sir Cecil., B. C. S.	1867
Beckwith, J., Esq.	1858
Benson, Lieut.-Col. R.	1854
Birch, Major General Sir R. J. H., K. C. B.	1863
Blagrove, Major T. C., 26th Regiment, B. N. I.	1859
Blane, Col. Sir S. J.	1869
Boycott, Dr. T., B. M. S.	1860
Brandreth, The Hon'ble J. E. L.	1868
Broderick, H. C., Esq., M. D.	1868
Brodie, Capt. T., 5th Regiment, B. N. I.	1853
Campbell, Dr. A.	1862
Cleghorn, Dr. H.	1867
Colvin, J. H. B., Esq., B. C. S.	1853
Cox, W. H., Esq.,	1866
Crockett, Oliver R., Esq.	1861

* These names will be removed from the next list of members unless intimation is meanwhile received from any of the members of their desire to retain the privileges of ordinary members under the operation of Rule 14 A.

	<i>Date of Leaving India.</i>
Dalrymple, F. A., Esq.	1865
Devereux, The Hon'ble H. B., B. C. S.	1862
Dunlop, H. G., Esq.	1866
Earle, Capt. E. L., Bengal Artillery.	1864
Eatwell, Dr. W. C. B.	1861
Ellis, Lieut.-Col. R. R. W.	1861
Edgeworth, M. P., Esq., B. C. S.	1862
Elphinstone, Capt. M. W., 30th Regiment, B. N. I.	1863
Erskine, The Hon'ble C. J., Bombay C. S.	1863
Erskine, Major W. C. B.	1859
Eyre, Col. Vincent C. B.	1863
Fitzwilliam, The Hon'ble W. S.	1863
Frederic Prince of Schleswig Holstein, H. R. H.	1869
Frere, Sir H. Bartle, K. C. B., B. C. S.	1867
Grant, The Hon'ble Sir J. P., K. C. B.	1862
Grant, T. R., Esq.	1863
Gladstone, W., Esq.	1856
Goodeve, E., Esq., M. D.	1865
Guthrie, Col. C. S.	1867
Hall, F. E., Esq., M. A., D. C. L.	1862
Hamilton, Col. G. W.	1867
Hannington, Col. J. C., 63rd Regiment, N. I.	1862
Hardie, Dr. G. K.	1861
Harington, The Hon'ble H. B.	1865
Henry, N. A., Esq.	1867
Hichens, Major W., Royal Engineers.	1857
Hyatt, Dr., B. N.	1868
Jackson, W. B., Esq., B. C. S.	1854
Johnstone, J., Esq.	1854
Jones, R., Esq.	1862
Kane, H. S., Esq.	1803
Kay, Rev. W.	1864
Laing, The Hon'ble S.	1862
Lindsay, E. J., Esq.	1860
Liebig, Dr. G. von.	1859
Lovett, Major B., R. E.	1866
Lushington, F. A., Esq.	1861
Macrae, Dr. A. C.	1869
Maine, The Hon'ble Sir H. S.	1869
Mair, D. K., Esq.	1865

	<i>Date of Leaving India.</i>
Marshman, J. C., Esq.	1856
McClelland, Dr. J.	1865
Middleton, J., Esq.	1857
Miles, A. J. M., Esq., B. C. S.	1856
Money, D. J., Esq., B. C. S.	1859
Muir, J., Esq.	1854
Nicholls, Capt. W. T., 29th Regiment, M. N. I.	1861
O'Shaughnessy, Sir W. R.	1857
Ouseley, Major W. R.	1858
Paul, J., Esq.	1869
Petit, Mons. Eugene,	1889
Place, Mons. V.	1868
Riddell, The Hon'ble H. B., B. C. S.	1867
Rogers, Capt. T. E.	1857
Schiller, F., Esq.,	1869
Scott, Col. E. W. S.	1862
Sherwill, Lieut.-Col. W. S., 66th Regiment, B. N. I.	1861
Smith, Col. J. F.	1857
Stephen, Major J. G., 8th N. I.	1859
Thompson, J. G., Esq.	1865
Thurlow, The Hon'ble T. J. H.	1863
Torrens, Col. H. D.	1866
Trevelyan, The Right Hon'ble Sir C., K. C. B.	1865
Trevor, The Hon'ble, C. B., B. C. S.	1867
Wall, P. W., Esq., C. E.	1864
Ward, J. J., Esq., C. S.	1861
Warrand, R. H. M., Esq., B. C. S.	1865
Watson, J., Esq., B. C. S.	1859
Waugh, Major General Sir A. S., C. B., F. R. S.	1861
Wilmot, E. W., Esq.	1869
Wortley, Major A. H. P.	1861
Young, Lieut.-Col. C. B.	1862
Yule, Col. H., R. E.	1862

LOSS OF MEMBERS DURING 1872.

By RETIREMENT.

W. Oldham Esq., LL. D., C. S.	Europe
Lieut.-Col. J. J. McLeod Innes.	Calcutta
Lieut.-Col. D. J. F. Newall, R. A.	Gwalior
Dr. G. W. Leitner.	Lahore
J. A. Aldis, Esq.	Calcutta
Khalifah Sayyid Muhammad Husain.	Patiala
The Hon'ble W. Markby.	Calcutta
W. E. Ayrton, Esq.	Europe
J. A. Briggs, Esq.	Calcutta
J. Smith, Esq., C. S.	Ghazipur
F. N. Macnamara, Esq., M. D.	Calcutta
Major J. M. Graham.	Dhurrung
C. B. Saunders, Esq., C. B.	Hyderabad
M. L. Ferrar, Esq., C. S.	Fyzabad
Dr. S. M. Shircore.	Calcutta
S. Lobb, Esq.	Krishnagur
Col. J. F. Tennant, R. E.	Calcutta

By DEATH.

The Hon'ble Sir D. F. McLeod, C. B., K. C. S. I.	Europe
C. Horne, Esq., C. S.	Europe
W. Abbey, Esq.	Rangoon
Dr. T. C. Jerdon.	Europe
Capt. A. B. Melville.	Europe
J. W. Laidlay, Esq.	Europe
Rev. J. Roberts.	Europe
Sir W. Denison, K. C. B.	Europe
Dr. T. Goldstücker, Corresponding Member.	Europe
Col. W. H. Sykes, F. R. S., Honorary Member.	London

ELECTIONS CANCELLED.

Nawab Ziauddin Ahmad Khan Bahadur.	Delhi
Capt. A. J. Filgate, R. E.	Calcutta

[APPENDIX.]

ABSTRACT STATEMENT
OF
RECEIPTS AND DISBURSEMENTS
OF THE
ASIATIC SOCIETY OF BENGAL
FOR
THE YEAR 1872.

STATEMENT

Abstract of the Cash Account

RECEIPTS.

		1872.	1871.
ADMISSION FEES.			
Received from Members, ...	Rs. 768 0 0	768 0 0	1,472 0 0
SUBSCRIPTIONS.			
Received from Members, ...	... 7,551 0 0	7,551 0 0	7,044 7 0
PUBLICATIONS.			
Sale proceeds of Journal and Proceedings,	399 7 9		
Subscriptions to ditto, ...	... 854 12 0		
Refund of Postage Stamps,...	... 17 11 0		
Ditto of Freight, ...	... 3 6 0		
Ditto of packing charges, ...	... 1 4 0		
		1,276 8 9	1,729 8 3
LIBRARY.			
Sale proceeds of Books, ...	... 258 8 0		
Refund of Freight, ...	... 14 6 0		
Ditto of Postage Stamps, ...	... 4 4 0		
		277 2 0	371 3 3
SECRETARY'S OFFICE.			
Received Commission on purchase of Postage Stamps,...	... 11 3 0		
Saving of Salary, ...	... 5 8 0		
Received Fine, ...	... 3 0 0		
		19 11 0	32 7 10
VESTED FUND.			
Received Interest on the Government Securities from the Bank of Bengal, ...	... 110 0 0		
Less Income-Tax on ditto, ...	... 1 2 0		
		108 14 0	108 14 0
MISCELLANEOUS.			
O. P. Fund, ...	... 83 2 2		
The Government North Western Provinces, ...	... 13 8 0		
Syed Walioollah, ...	... 534 2 0		
Dr. J. Baxter, ...	... 0 6 0		
Babu Odaya Chanda Datta, ...	... 0 9 0		
Messrs. Williams and Norgate, ...	... 1 0 0		
M. Sashagiri Sastri, ...	... 12 0 0		
The Baptist Mission Press, ...	... 11 10 0		
F. S. Growse, Esq. ...	... 4 3 0		
Capt. G. E. Fryer, ...	... 7 12 0		
Dr. A. Neil, ...	... 0 2 10		
Dr. E. Stoliczka, ...	... 6 8 0		
The Rev. F. Mason, ...	... 3 12 0		
E. V. Westmacott, Esq. ...	... 34 15 0		
		713 10 0	
		Carried over, Rs. 10,001	3 9

No. 1.

of the Asiatic Society for 1872.

DISBURSEMENTS.

PUBLICATIONS.	1872.	1871.
Paid Freight for sending Journal and Proceedings to Messrs. Williams and Norgate, Rs. 40 6 0		
Ditto Lithographing & Engraving charges, 1,371 0 0		
Ditto Printing charges, 4,741 3 0		
Ditto Commission on Sale of Books, &c., 42 2 9		
Ditto Binding charges, 6 8 0		
Ditto Paper for Plates, &c., 155 12 6		
Ditto Purchase of Postage Stamps, 234 5 2		
Ditto Price of two Plates from London, 81 15 0		
Ditto Freight and sending charges for ditto, 16 8 3		
Ditto Petty charges, 13 11 6		
	6,703 8 2	5,273 14 10
 LIBRARY.		
Paid Salary of the Librarian, 990 0 0		
Ditto Establishment, 120 0 0		
Ditto Commission on Sale of Books, 27 9 9		
Ditto Landing charges, 14 14 0		
Ditto Book binding, 9 8 0		
Ditto Subscription to the Medical Gazette, 15 0 0		
Ditto Salary of Punkhaman, 17 0 0		
Ditto Insufficient Postage, 1 7 0		
Ditto Subscription to the Indian Anti-quary, 20 0 0		
Ditto Subscription to the Calcutta Review, 16 0 0		
Ditto Purchase of Books, 93 0 0		
Petty charges, 19 13 6		
	1,344 4 3	2,540 14 9
 SECRETARY'S OFFICE.		
Paid General Establishment, 366 0 0		
Ditto Secretary's Office Establishment, ... 1,592 0 0		
Ditto Purchase of Postage Stamps, 97 7 10		
Ditto Ditto Stationery, 51 3 6		
Ditto Insufficient Postage, 2 12 0		
Ditto Meeting charges, 140 14 6		
Ditto Commission on Collecting Subscriptions, 42 3 0		
Ditto Salary of Mali, 57 0 0		
Ditto Subscription to the Army List, 30 0 0		
Ditto Ditto Directory, 14 0 0		
Ditto Printing charges, 62 6 3		
Ditto a Sheet Almanac, 1 0 0		
	2,456 15 1	
Carried over, Rs.	8,057 12 5	

		RECEIPTS.		1872.		1871.
Brought over, Rs.		713	10	0	10,001	3 9
E. T. Atkinson, Esq.	...	...	8	1	9	
Capt. W. J. Williamson,	...	...	3	1	0	
A. Anderson, Esq.	...	...	2	13	0	
Dr. F. Day,	...	...	4	6	0	
L. Schwendler, Esq.	...	...	5	4	0	
The Hon'ble E. C. Bayley,...	...	...	0	6	0	
G. Nevill, Esq.	...	...	1	8	0	
J. Wood-Mason, Esq.	...	...	9	12	6	
		<hr/>		748		14 3

Carried over, Rs.

10,750 2 0

DISBURSEMENTS.

1872.

1871.

Brought over, Rs.	2,456	15	1	8,047	12	5
Ditto Advertising charges, ...	...	8	4	0		
Paid a Copy of Postal Guide, ...	...	1	8	0		
Ditto Fee to the Bank of Bengal for						
Stamping Blank Cheques, ...	...	1	9	0		
Ditto repairing a Clock, ...	...	21	0	0		
Ditto Ditto Case for ditto, ...	...	5	0	0		
Ditto Petty charges, ...	...	25	12	0		
				2,520	0	1 2,018 10 2

VESTED FUND.

Paid Commission to the Bank of Bengal						
for drawing interest on the Govern-						
ment Securities, ...	...	0	4	4	0	4 4

BUILDING.

Paid House rate, ...	...	432	0	0		
Ditto Police and Lighting rate, ...	...	198	0	0		
Ditto Water rate, ...	...	211	11	0		
Ditto Repairing charges, ...	...	11	12	3		
					853	7 3 877 3 2

COIN FUND.

Paid for Purchase of 29 Silver Bactrian						
Coins, ...	...	110	0	0		
Ditto Insufficient Postage on a parcel of						
Coins, ...	...	0	3	0		
Ditto Postage Stamps for returning a						
packet of Coins to England to the						
address of Mr. Foster, ...	...	25	6	0		
Ditto Tinman for shutting Tin Case						
for ditto, ...	...	0	2	0		
					135	11 0 0 0 0

MISCELLANEOUS.

Syed Wallioollah, ...	...	531	7	6		
Dr. J. F. N. Wise, ...	...	0	12	0		
J. Wood-Mason, Esq., ...	...	6	9	0		
The Baptist Mission Press, ...	...	11	10	0		
Babu Pratapa Chandra Ghosha, ...	...	3	10	6		
Dr. F. Day, ...	...	4	6	0		
E. T. Atkinson, Esq., ...	...	6	11	9		
F. S. Growse, Esq., ...	...	1	8	0		
M. Sashagiri Sastri, ...	...	12	0	0		
E. V. Westmacott, Esq., ...	...	34	15	0		
J. Beames, Esq., ...	...	6	12	0		
E. C. Bayley, The Hon'ble, ...	...	0	6	0		
Col. J. C. Haughton, ...	...	0	7	0		
Capt. W. L. Samuells, ...	...	2	2	0		
Col. H. Hyde, ...	...	4	0	0		
A. M. Broadley, Esq., ...	...	4	0	0		
Capt. W. J. Williamson, ...	...	4	4	0		

635 8 9

Carried over, Rs. 11,557 3 1

	RECEIPTS.	1872.	1871.
	Brought over, Rs.	10,750 2 0	
BALANCE OF 1871.			
In the Bank of Bengal, ...	...	2,236 5 7	
Cash in hand, ...	...	216 14 3	
		<hr/>	2,453 3 10

Rs. 13,203 5 10

(Sd.) BUDDINATH BYSACK,
Cashier,
Asiatic Society Bengal.

(Sd.) LOUIS SCHWENDLER,
 (Sd.) F. W. PETERSON,
Auditors.

DISBURSEMENTS.

1872.

1871.

	Brought over, Rs.	635	8	911,557	3	1
O. P. Fund,	59	5	0		
The Government North Western Pro-	...					
vinces,	13	8	0		
A. M. Markham, Esq.	...	1	4	0		
J. G. Delmerick, Esq.	...	1	0	0		
L. Schwendler, Esq.	...	5	4	0		
The Rev. F. Mason,	...	3	12	0		
A. V. Nursing Rao,	...	0	4	0		
W. Stokes, Esq.	...	0	2	0		
A. Anderson, Esq.	...	11	15	6		
V. Richards, Esq.	...	2	11	0		
					734	10 3
BALANCE.						
In the Bank of Bengal,	767	9	4		
Cash in hand,	143	5	2		
					911	8 6

Rs. 13,203 5 10

(Sd.) BUDDINATH BYRACK,
Cashier,
Asiatic Society Bengal.

(Sd.) LOUIS SCHWENDLER,

(Sd.) F. W. PETERSON,

Auditors.

STATEMENT

Abstract of the Cash Account

RECEIPTS.

ORIENTAL PUBLICATIONS.	1872.	1871.
Received by Sale of Bibliotheca Indica,... Rs.	2,502 11 8	
Ditto by Subscription to ditto, ...	20 0 0	
Ditto Refund of Postage and Packing charges,	47 9 0	
	<u>2,570 4 8</u>	2,581 1 0

GOVERNMENT ALLOWANCE.

Received from the General Treasury at 500 Rs.				
per month, ...	6,000	0 0		
Ditto ditto additional grant for the publica-				
tion of Sanskrit works, at 250 Rs. per				
month, ...	3,000	0 0		
	<u>9,000</u>	0 0	9,000	0 0

Col. E. Dalton, Ethnology of Bengal,	44 7 0	
Asiatic Society of Bengal,	59 5 0	
J. R. Reid, Esq.	1 7 0	
P. Toromul Rao,	10 0 0	
Munshi Kapursing,	7 8 0	
Thakur Goprasad Singh,	100 0 0	
Dr. James Wise,	9 6 0	
Ram Kissen G. Bhauder Ker,	11 0 0	
Krishna Rao Haumant,	100 7 0	
Babu Rutton Lal,	1 6 0	
Dr. G. Buhler,	20 0 0	
Kavipurupa Venkataratnam,	8 0 0	
Babu Kader Nath Ghosal,	10 0 0	
Pandita Sheonarain,	24 12 0	
Balbhia Deb Sing,	2 0 0	
Babu Broj Bhushun Doss,	6 4 6	
Jubananand Joshee,	0 14 0	
	<u>416 12 6</u>	

CONSERVATION OF SANSKRIT MSS.

Received from the Accountt. General of Bengal,				
in part of the amount sanctioned towards				
the conservation of Sanscrit MSS. being				
the 2nd half of 1871-72, ...	1,550	0 0		
Ditto ditto the 1st half of 1872-73, ...	1,550	0 0		
Refund of the amount paid Babu Rajendra				
Lala Mitra, as advance for purchase of				
Sanscrit MSS. ...	400	0 0		
Sale proceeds of 13 Copies of Notices Sans-				
crit MSS. ...	13	0 0		
Refund by transfer to the O. P. Fund, being				
the amount paid to Premchand Chaudhry,				
his salary for the month of April last, ...	30	0 0		
	<u>3,543</u>	0 0	1,344	0 0

Carried, over, Ra. 15,530 1 2

No. 2.

Oriental Publication Fund for 1872.

DISBURSEMENTS.

ORIENTAL PUBLICATIONS.		1872.	1871.
Paid Commission on Sale of Books,	Rs. 261 13 0		
Packing charges, ...	32 13 6		
Postage Stamps, ...	112 5 0		
Advertising charges, ...	400 0 0		
Freight, ...	147 0 0		
Bearing Postage, ...	0 2 0		
Commission on collecting Bill, ...	1 3 3		
Petty charges, ...	3 15 3		
		959 4 0	1,190 14 3
LIBRARY.			
Paid Purchase of 150 copies of Sanscrit MSS.	313 14 0		
Ditto as advance of Subscription Hindu Com- mittee, Vol. V., Nos. 1 to 12, ...	10 0 0		
		323 14 0	190 14 6
CUSTODY OF ORIENTAL WORKS.			
Paid Salary of the Librarian, ...	360 0 0		
Establishment, ...	574 0 0		
Stationery, ...	72 9 0		
Fee for Stamping Cheques, ...	3 2 0		
Book binding, ...	14 4 9		
Petty charges, ..	14 5 0		
		1,038 4 0	1,083 3 6
CATALOGUE OF SANSKRIT MSS.			
Paid Salary for Cataloguing Sanscrit MSS., at 30 Rs. per month, ...	360 0 0		
		360 0 0	360 0 0
MAASIR ALAMGIRI.			
Paid Printing charges, ...	445 0 0		
		415 0 0	550 0 0
FARHANG I RASHIDI.			
Paid Editing and Printing, ...	1,153 0 0		
		1,153 0 0	703 0 0
GOBILYA GRIHYA SUTRA.			
Paid Printing charges, ...	474 0 0		
		474 0 0	406 2 0
TANDYA MOHA BRAHMANA.			
Paid Editing and Printing charges, ...	656 6 0		
		656 6 0	1,312 12 0
SAMA VEDA.			
Paid Editing and Printing charges, ...	656 6 0		
		656 6 0	984 9 0
TATTIRIYA PRATISAKHYA.			
Paid Editing and Printing charges, ...	593 9 0		
		593 9 0	328 3 0
MIMANSA DARSHANA.			
Paid Printing charges, ...	109 11 0		
		109 11 0	539 10 0
Carried over, Rs.		6,769 6 0	

RECEIPTS.	1872.	1871.
Brought over, Rs.	15,530 1 2	

DISBURSEMENTS.				1872.	1871.
Brought over, Rs.				6,769	6 0
TAITTIRIYA SANHITA OF THE BLACK YAJUR VEDA.					
Paid Editing and Printing charges,	...	956	0 0	956	0 0 339 12 0
CHATURVARGA CHINTAMANI.					
Paid Editing and Printing charges,	...	1,312	12 0	1,312	12 0 656 6 0
ATHARVANA UPANISHAD.					
Paid Editing and Printing charges,	...	332	9 0	332	9 0
GOPATHA BRAHMANA.					
Paid Editing and Printing charges,	...	662	2 0		
Ditto Banghy expense for sending MSS.	...	1	11 0	563	13 0 232 3 0
PINGULA GRHANDA SUTRA.					
Paid Printing charges,	...	232	3 0	232	3 0
AKBAR NAMA.					
Paid Editing charges,	...	96	0 0	96	0 0
TABAQAT I NASIRI.					
Paid Messrs. Gilbert Rivington, Printer, London, for Printing charges by a Bill of Exchange, £50-10-6, on the Cashier of Oriental Bank, London, at 1-10 $\frac{1}{2}$,				533	0 0
LATIYANA SRAUTA SUTRA.					
Banghy expenses for sending 2 Packets of ditto to Benares,	...	2	4 0	2	4 0 232 3 0
TAITTIRIYA ARANYAKA.					
Paid Editing charges,	...	151	8 0	151	8 0 396 8 0
AIN I AKBARI.					
Paid for Purchase of Ain i Akbari,	...	45	8 0		
Editing charges,	...	192	0 0		
Printing charges,	...	703	0 0		
Preparing a Geographical Index 4500 Names to the Ain i Akbari,	...	80	0 0		
Postage and Registering Fee for,	...	1	1 3	1,021	9 0 1,120 8 0
POEMS OF CHAND.					
Paid Printing charges,	...	30	0 0		
Freight and Packing charges for sending Poems of Chand,	...	4	10 6	34	10 6 8 15 0
COPYING MSS.					
Paid copying charges,	...	57	9 0	57	9 0 198 5 0
Asiatic Society of Bengal,	...	83	2 2		
J. Woodburn, Esq.	...	5	4 6		
Pandita Chandrakanta Tarkalanker,	...	22	12 0		
Ram Krishna G. Bhaunderka,	...	11	0 0		
Babu Broj Bhusan Doss,	...	43	10 0		
Krishna Rao Hanmant,	...	100	7 0		

266 3 8

Carried over, Rs. 12,063 3 6

RECEIPTS.				1872.	1871.
Brought over, Rs.				15,530	1 2
BALANCE OF 1871.					
In the Bank of Bengal, viz., Account-Current.					
Dr. J. Muir,	...	...	898	10	0
Ditto Conservation of Sanscrit MSS.,	...	...	2,849	0	11
Ditto Col. Dalton, Ethnology of Bengal,	...	...	2,450	12	0
Ditto O. P. Fund, ...	...	...	1,786	5	7
				7,984	12 6
Cash in hand, ...	...	...	21	14	7
				8,006	11 1

Rs. 23,536 12 3

(Sd.) BUDDINATH BISACK,
Cashier.
Asiatic Society of Bengal.

(Sd.) LOUIS SCHWENDLER,
(Sd.) F. W. PETERSON,
Auditors.

DISBURSEMENTS.

1872.

1871.

	Brought over, Rs.	266	3	8	12,063	3	6
Thakur Griprasad Singh,	...	100	0	0			
Balvadeb Sing,	...	2	13	0			
Pandit Sheonarian,	...	3	8	9			
Dr. James Wiso,	...	9	6	0			
Kapursing Maushi,	...	7	8	0			
Col. E. T. Dalton, Ethnology of Bengal,	...	2,520	5	0			
						2,909	12 5

CONSERVATION OF SANSKRIT MSS.

Paid Salary for preparing Catalogue of Sanscrit MSS.,	...	360	0	0			
Ditto ditto for translating the Sanscrit Catalogue,	...	240	0	0			
Ditto Printing charges of Notice of Sanscrit MSS.,	...	1,198	12	0			
Ditto Postage for sending Notices of ditto ditto,	...	3	7	6			
Ditto Freight for ditto ditto,	...	70	0	0			
Ditto Copying MSS.,	...	24	8	0			
Ditto Pasteboard, &c., for Pattas for binding Sanscrit MSS.,	...	18	9	6			
Ditto for Stationery,	...	13	5	0			
Ditto Printing 2,000 Copies of Blank Form, ..	...	65	0	0			
Ditto Purchase of Sanscrit MSS.,	...	365	13	0			
Ditto Banghy Expenses for sending MSS.,	...	1	11	0			
Ditto Packing charges,	...	25	6	0			
Ditto by transfer to the O. P. Fund, being the Salary of Promchandra Chaudhury, for the month of April last,	...	30	0	0			
Ditto Petty charges, ,	...	2	0	6			
					2,415	8	6
					17,388	8	5

BALANCE.

In the Bank of Bengal.							
Dr. J. Muir,	...	898	10	0			
Conservation of Sanscrit MSS.,	...	3,976	8	5			
O. P. Fund,	...	1,262	8	9			
		6,137	11	2			
Cash in hand,	...	10	8	8			
					6,148	3	10
					Rs. 23,536	12	3

(Sd.) BUDDINATH BYSACK,
Cashier.
Asiatic Society of Bengal.

(Sd.) LOUIS SCHWENDLER,
 (Sd.) F. W. PETERSON,
Auditors.

STATEMENT No. 3.

Shewing the Assets and Liabilities of the Asiatic Society of Bengal on the 1st Jny. 1873.

	ASSETS.		LIABILITIES.	
	1872.	1871.	1872.	1871.
CASH.				
In the Bank of Bengal,	767 9 4	8,434 12 6	Salary and Establishment for December, 1872, (actual),	247 14 8
Cash in hand, ...	143 15 2	216 14 3	PUBLICATIONS.	300 0 0
Government Securities,	2,000 0 0	2,000 0 0	Proceedings, Nos. 7 and 8 (actual),	
	2,911 8 6	10,651 10 9	" No. 9 (actual)	263 2 0
			" No. 10 and Index (actual) being 22 pp. Journal Part I No. 2 1872, (actual),	131 12 0
OUTSTANDING.				
Admission fees,...	320 0 0	384 0 0	" Nos. 3 and 4 (estimated) 170 pp. @ 4-2 and Index, ...	118 8 0
Subscription, "	5,685 9 0	5,086 11 8	Part II Nos. 3 & 4 1872 (actual),	494 8 0
Sale of Journal, "	357 9 0	393 13 11	Plates Paper for the above, Printing of ditto (actual),	760 0 0
Subscription of do.	796 2 9	996 3 9	Meteorological Reports	909 8 0
Sale of Library Books,	390 7 0	351 7 0	Printing for September to December, 1872, ...	74 2 0
O. P. Fund, ...	112 8 0	136 5 2		232 0 0
			Building House Rate &c., Library.	28 0 0
			Williams and Norgate, ... Messrs. Trabner and Co.,...	3,011 8 0
				156 0 0
				2,000 0 0
				300 0 0
				200 0 0
				2,300 0 0
				5,715 6 8
				3,975 0 0

LOUIS SCHWENDLER.
F. N. PETERSON.

STATEMENT No. 5.

Conservation of Sanscrit MSS. in Account Current with the Asiatic Society of Bengal.

Cr.	Dr.
Balance of 1871, ... 2,819 0 11	Amount spent in 1872, ...
Received from the Government of Bengal, being the half sum sanctioned, annually Rs. 3,100, towards the conservation and publication of Sanscrit MSS. for the second half of 1871-72, ... 1,550 0 0	... 2,415 8 6
Ditto ditto for the 1st half 1872-73, ... 1,550 0 0	... 3,976 8 5
Refund of the amount paid Babu R. L. Mitra as advance for purchase of Sanscrit MSS. on the 9th October, 1871, .. 400 0 0	<u>6,392 0 11</u>
Refund by transfer to the O. P. F. the paid Prema Chandra Chaudhury his salary for the month of April, last, ... 30 0 0	
Sale proceeds of 13 copies of Notices of Sanscrit MSS., ... 13 0 0	
<u>6,392 0 11</u>	
Rs. ... 6,392 0 11	<u>Rs. ... 6,392 0 11</u>

LOUIS SCHWENDLER.
F. N. PETERSON.

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR JANUARY, 1873.

The Monthly General Meeting of the Society was held on Wednesday, the 8th instant, at 9 p. m.

T. Oldham, Esq., LL. D., President, in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen duly proposed and seconded at the last meeting, were balloted for and elected Ordinary Members—

G. L. Houstoun, Esq., J. Allen, Esq., H. C. Williams, Esq., C. S., H. L. Dennys, Esq., Lieutenant R. Wace, R. A., F. Schlegel, Esq., Colonel H. Drummond, R. E., Rev. J. D. Bate.

The following are candidates for ballot at the next meeting—

Richard Roskell Bayne, Esq., Architect, M. R. I., B. A., proposed by H. H. Locke, Esq., seconded by E. Gay, Esq., M. A.

T. R. Lewis, Esq., M. B., proposed by Captain J. Waterhouse, seconded by G. E. Dobson, Esq., M. B.

The following gentlemen have intimated their desire to withdraw from the Society—

Babu Rákháldas Haldár. A. E. Gough, Esq.

The election of C. P. Bird, Esq., is cancelled at his own request on his leaving India.

Letters were read—

From the Secretary to the Government of India, Foreign Department, forwarding a copy of the following paper by Lieutenant-Colonel Ross, Muskat.

An Account of the Tenets of the IBADHI Sect of 'OMÁN.

From a manuscript Arabic work entitled "The Keshf-ul-Ghummeḥ of the Sheikh Sirḥán bin Sa'íd Sirḥán bin Mohammed-el-'Alawí, a native of 'Omán," translated with prefatory Memorandum and Notes by E. C. Ross, Political Agent, Muskat.

PREFATORY REMARKS.

A large proportion of the Arabs inhabiting 'Omán, indeed the majority, belong to the sect of Muhammadans, called 'Ibádhi.' The origin, rise and distinctive doctrines of this particular sect seem to have been little known to European authors until very recent times. This is the more remarkable that the form of religion has, since its adoption in 'Omán, in the highest degree influenced the destiny of the people. From their peculiar opinions regarding the succession of 'Imáms' arose their form of Government under a head at once endowed with spiritual and temporal authority. It is evident how desirable it is that the fullest possible light should be thrown on this remarkable element in connection with the History of 'Omán.

The only clear and correct account of this sect we owe to the Reverend G. P. Badger, who, in an appendix to his work* on 'Omán, has given an account of the sect, and dispelled many erroneous ideas.

Previous writers have touched on the subject, but either very cursorily, or, where more fully, with a large admixture of fallacy.

By Niebuhr† the sect is mentioned as that of "Beiási," Beiadi or Abadi, the "principal sect in 'Omán," but his notice of it is short and not wholly correct.

In Wilsted's Travels‡ they are mentioned as "Khuwarajites," and the following remark occurs:—

"Their own Imám they regard in two points of view; as a temporal governor, and an absolute indefeasibly appointed sovereign, whose authority is of God."

The treatise on the Ibádhi tenets, a translation of which is now given, is extracted from a manuscript work of a native of 'Omán, the Sheikh Sirḥán bin Sa'íd of the Bení 'Alí tribe. The work is entitled "Keshf-ul-Ghummeḥ-el-Jamal akhbar-el-ummeḥ," and contains an account of several Eastern nations, and amongst other things a valuable account of the history of 'Omán. The author having been himself an 'Ománi of the Ibádhi persuasion, his account of the sect may be considered of value. It will be found corroborative of the points described in Mr. Badger's exposition.§

* History of the Imáms and Sayyids of 'Omán, 1871. Hakluyt Society.

† Niebuhr, Travels, Trans. p. 185, vol. 2.

‡ Travels in Arabia, p. 329, vol. 1.

§ Much of the matter is common to Mahommedanism generally.

The sect was founded by 'Abdullah ben Ibádh, and its denomination is derived from the surname of the founder who was descended from the parent of the Tamím tribe.*

Mr. Badger corrects the mistaken notion of this sect taking their name from the Arabic word meaning "white," or "pure," which was very generally entertained. Whether the patronymic was originally derived from the root verb, signifying "to be white," or not, matters little, but that a notion of whiteness attached to the name of the tribe Beni Ibádh is gathered from an old† couplet in the *Kámús* quoted by Mr. Lane.

'Abdullah bin Ibádhí was a man of learning, and apparently a sincere reformer. His doctrines were based on those of the Khárijites, or Seceders, which he wished to free from extravagant and irrational errors. Still many essential points are retained, such as the doctrines concerning Imáms or spiritual leaders.

In so far the Ibádhis may be reckoned reformed Khárijites, but the latter term, though applied to them by the orthodox, would by no means be admitted by themselves.

The commentary of the Koran in use amongst the priests of the Ibádhíyah is that of Zamakhshari who was of the Mu'tazilí sect of Khárijites.

Four sub-divisions of the Ibádhí sect are mentioned in a work quoted by Mr. Badger, (*The Kitáb-el-Mílal*), but these no longer exist; the subjects having become united in the time of Sayyid Sa'id bin Ahmad, the

* Pedigree.

Tamím.
Zeid Menát.
Sa'ád-el-Fizr.
Ka'áb.
'Am'r.
El-'Háarith [Tribe Mukais.]
Sárim.
Mórra.
E'Nazzal.
Obádh.
El-Honsein.
M'cáwia.
Káis.
El-'Ahnaf.
Thá'labe.
Tey'm-el-lát.
Ibádh.
Ab'd Allah.

From 'Genealogische Tabellen' of Dr. Wüstenfeld.

† Járiyatun fi dirihih el fadhfadhi—Abyadhu min Ukhti beni Ibádhí.

A damsel in her ample shift—whiter than the sister of the tribe Benu Ibádh.

Imám, under the auspices of a priest, the Sheikh Já'ad bin Khamís-el-Khárusí.

As a general rule, the Yemen tribes embraced the Ibádhi religion, whilst those from Najd were more inclined to the orthodox sect. In recent times, some of the latter have adopted the Wahnábí religion. The Imáms of the Ibádhíyeh were almost invariably selected from Yemen families. At the present time the religious title is in abeyance.

With regard to doctrine it is thought that the dissertation of the Sheikh Sirhán may throw additional light on this part of the subject. Perhaps the most important feature as regards their history is their rejection of the Khalífares of 'Othmán and 'Alí and their assumption of the right to elect their own Imáms, whom they entitle "Imáms of the Moslems." The so-elected Imám has had usually also political power.*

A point much insisted on by Ibádhí teachers is, that the simple profession of belief cannot cover criminal conduct, and that sin, whether of believer or infidel, is followed by punishment unless, in the case of the former, he publicly repents of his sins.

The discrepancies between theory and practice in the religious observances of this sect may have caused some misapprehension. Whilst many professed Ibádhís exhibit considerable laxity and licence, still, when the priests can have their will, they affect a puritan austerity and strictness, and would, if they had the power, enforce their views with great harshness. In the matters of drinking of liquor, smoking, raiment, &c., the Ibádhí Muttawas, or priests, have proved themselves, when they had the opportunity, as bigoted and intolerant as their confrères of the Wahnábí sect.

This refers to modern practice, but the founder of the sect seems to have aimed at rational reform according to his lights, and many of the extreme and intolerant opinions of other sects have no place in that of the Ibádhís; such fictions as the journey of the Prophet to heaven are rejected as merely figurative. On the whole the doctrines promulgated by 'Abdullah bin Ibádhí are characterized by a puritanic, but not wholly intolerant spirit.

May, 1872.

E. C. Ross,
Political Agent at Maskat.

* The official residence of the "Imáms" was at one of the following towns:—
Nezwá Rostack or Sohar—at these towns only could they perform Friday's devotional services.

Translation from the Kesef-ul-Ghumme-el-Jâmi-el-akhar-el-ummeh of the Sheik Sirhân ben Sa'id-el-'Alawî of 'Omán.

CHAPTER XXIX.

On the tenets of the Ibádhi sect, whose is the true Religion, founded on the Book and the law, and concurrent testimony.

The sect is denominated Ibádhi after the Imám of the Muslims, 'Abdullah bin Ibádh bin Teym-el-Lát bin Thalabeh bin Rahat-el-Elinaf bin Kais-el-Tamîni. He it was who withdrew from all the various erring sects such as* the Motezeliyeh, the Kaderiyeh, the Sefatiyeh, the Jahmiyeh,† the Khawárij Rawáfidh,‡ and the Shíah.

He was the first to expose their false doctrines and to nullify the banefulness of their heresies by convincing arguments and the clearest demonstration.

He grew to manhood in the time of Muáwiyeh bin Ali Safiyan, and lived to the time of Abd-el-Malek bin Marwán,§ to whom he wrote his celebrated epistles and exhortations on moral conduct.

The origin of the sect is traced up to 'Abdullah bin-el-Abbás, and Abúshá'tha jabir-bin Zeyd. It derives from the people of Nahrawan|| and Nakhileh and from the survivors from the fields of ¶ Siffin and el-Jamal.** Further from the "companions," such as Anmár bin Yásir Khozeymeli bin Thabib (The-Shaha detein) Mahommed and Abdullah bin Mesúd, Hadifeh bin-el-Yemon, Ma-áth bin Hebl, Abd-er-Rhmán-bin 'Owf, Selman the Persian, Bilat the Abyssinian, Sâhib the Greek and 'Áshesh mother of the Faithful. Also from the accepted and well approved Khalífehs Abú Bekr and 'Omar, the companions of the Flight, and the Ansárs or co-adjutors, may God be pleased with them all.

'Abdullah bin Ibádh confuted the several fallacies in the doctrines of the various heretical sects, which have been shewn in a previous part of this work. He taught that Faith (Imán) consists both in word and deed†† and in following the precepts of traditional Law.

In this religion there is no sanction excusing any shortcoming in respect of it. Nor is it permitted falsely to avow it. Nor to give way to the passions. For this religion requires that the paths of righteousness be followed, and also belief in the following, viz. :—

* The first three are properly included in the general term of Khawárij.

† From Jahm bin Safwán.

‡ The Ráfídhí is a sect of the Shí'ás of El Kúfeh, so called from having forsaken one Zeyd bin Ali when he forbade them to speak against the companions of the Prophet. The term is applied to those who abuse 'Omar and Abú Bakr.

§ From A. D. 661 to A. D. 705.

|| i. e. the Khárijites defeated by 'Alí at Nahrawán A. H. 38.

¶ Where 'Alí encountered Muwíyeh.

** Where 'Alí encountered 'Áshesh.

†† i. e. that what is confessed in words as right must also be acted on.

In God and his Angels: in His Scriptures and Prophets: in Paradise and Hell: in His promises and warnings: in the Resurrection and the Judgment and the Last Day: in the messages brought by the Prophets from their Lord. It is also necessary to believe that the Korān is the word of God sent down to His Apostle Muhammad: that His rewards are unrivalled, as His punishments are unequalled, and that the mercies He vouchsafes are great, even as the trials He imposes are great. Also that God is the Creator of all things, There is none other than He, His promises are not broken, nor His threats unfulfilled, for His word is true. That all that has been revealed through Muhammad bin 'Abdullah is manifest truth.

The most High God: eyes perceive him not but he comprehendeth the vision.* He is All-knowing, All-wise. The limits of the Heavens contain Him not, He is God. There is none other God than He, the one, mighty. He is the Creator who maketh all things and giveth form thereto. Who raiseth up and finally disposeth of all. Life is His gift and He causeth to die. He is the Living who dieth not, All powerful. One and everlasting, unbegotten and unbegetting. All powerful to do that He willeth. Imagination comprehendeth Him not, nor do created forms resemble Him. Neither movement nor repose can be attributed to him. All in earth and Heaven is His, and that which is between. He knoweth all things before they exist. Time changeth him not. Possessor of might, majesty and power. Undying, without compeer, companion, or offspring, His word goeth forth and what He willeth is. Praise be to Him in whose hand is power over all things, to whom all things revert.

The Religion† of Islām also is based on Faith. This‡ consists in testifying that there is but one God, without co-partner, that Muhammad was his servant and messenger sent to guide to the true Religion, making it manifest to people of all creeds, regardless of the scoff of the Infidel. Since the Religion was brought from God, it is manifest truth. No doubt nor uncertainty attaches to it. As to the coming Hour, there is no doubt of that, nor that God will raise the dead from their graves. But Islām in its completeness requires the practice of the following observances:—

Religious Observances. §

Firstly.—Prayer with its accompanying rites, conditions;|| such as the

* Korān VI. 103. The mental perception attains not to the knowledge of His nature.

† Faith.

‡ The orthodox describe Faith to consist in belief, 1st in God, 2nd His Angels, 3rd Scriptures, 4th Prophets, 5th Resurrection, and His Decrees.

§ 1, Prayer, 2, Almsgiving, 3, Fasting, 4, Pilgrimage.

|| *Conditions of Prayer.*

1. Members of the body must be free from impurity.

necessary purifications and washings; observance of appointed times, selecting a pure place, and turning towards the Kibleh.

Prayer must be offered with earnest intention, and any word or deed calculated to affect the perfection of the act must be avoided. It is needful to understand the essential principles of Prayer, to discriminate between those forms prescribed for persons at home and those for journeying. To know the observances for Fridays according to the ordinances of the Almighty as laid down by His Apostle and the just "Imáms" who followed him. The believer should be acquainted with the forms of prayer for festivals, for the dead, and those to be repeated in times of trouble. Also the distinctions of voluntary and supererogatory prayers and the rest as enjoined by the Prophet.

Alms.

Secondly.—Alms.* The payment of Zekát, or Legal alms, from such property as the Law ordains. The obligations regarding this must be understood and the Zekát paid to the proper parties where the Nisáb† (Estate) reaches the full value, the proper proportion being paid from the flocks.

The Zekát-el-Fiṭr also must be paid, that is a‡ Sá' measure from the consumption of each person. The dole to be given to the proper persons among the poor.§

Fasting.

Thirdly.—Fasting which consists in keeping the Fast of Ramadhán with sobriety and abnegation and in all things attending to what is laid down, and abstaining from all that is forbidden by God and His Prophet with knowledge of the proper rites.

Pilgrimage.

Fourthly.—Pilgrimage to the Holy House of God for those who are in a|| position to perform it, with the enjoined conditions, namely, abstain-

2. Garments must be clean.
3. A clean place is necessary.
4. Fixed times must be observed.
5. The face must be turned towards the Kibleh.

* Alms are of two kinds, Zekát, or legal alms, and Sadakát, or voluntary. The first being divided by law on fixed conditions.

† The property must reach a certain value in cattle called Nisáb.

‡ Six pounds. This is paid at the termination of the Fast of Ramadhán.

§ Alms are levied on five things, 1, cattle, 2, money, 3, corn, 4, fruits, 5, merchandize. The Ibádhis should pay to their Imám.

|| Amongst the Ibádhis a person must have amassed sufficient for expenses, and one year's ordinary expenditure in addition, before making the pilgrimage.

ing from sin; tarrying on 'Aráfát, visiting the Temple and making the circuit, and throwing the stones.*

These rites must be accompanied by understanding of the obligations† and laws of the Pilgrimage, such as making atonement for slaying of game‡ or the cutting down of trees.

Religious Precepts and Laws.

Generally it is necessary to observe the precepts of the Korán as to gifts to relations and parental piety, and acting righteously and avoiding evil. Also as to the Jehád or warring against infidels and rendering their dues to kinsfolk, wayfarers, &c. Instituted observances and civil laws must be attended to, including prohibition of wine, or other intoxicating liquor, also abstaining from food, or wearing of apparel forbidden by the Korán.

* * * * *

It is forbidden to wail, beat the face, rend the garments, or tear the hair (in grief). It is forbidden to make pilgrimage to the tomb of any save the Prophet. Women are forbidden to adorn themselves for any but their husbands, saving the wearing of a finger ring and anointing the eyes with collyrium. It is incumbent to salute the Faithful and return their salute. Silken clothes and gold are forbidden to men. In fine, the Believer must avoid all that God has forbidden, whether mentioned or omitted.

Doctrine.

It is essential to be free from the error of those who hold that good and evil are of God, and that all sins are capable of expiation.§

Those who do the right whether written or unwritten should receive support.

It is necessary to be clear of the errors of the sect of the Sefátiych,|| who believe that persons who indulge in things forbidden by God and

* In Míná Valley the pilgrim throws 3 stones typical of Ibrahim driving away Satan who sought to tempt him.

† The five chief points to be observed are :—

1. The spirit or intention.
2. Praying on Mt. 'Aráfát,
3. Shaving in Míná Valley.
4. Circuit of the Temple.
5. Running seven times from Safá to Merwá.

‡ After donning the Ihram, or pilgrim's dress, the pilgrim must kill no game, and not even the vermin on their bodies under penalty of expiatory offerings.

§ On this point the Ibádhis differ from Sunnites.

|| The Sefatians, or Attributists, comprise Asharians, Mushobbehites, Keramians, Jabarians, and Morjians.

violate His prohibitions may still be in the Faith; and who doubt His promises and warnings.

The false doctrines of the sect called Morjiyeh* are also renounced by the Believers (Ibádhi), for they pretend that God will punish them for a limited period, after which He will release them from torment, and cause them to enter Paradise, receiving them after being angered against them.

Let the errors of the sect of the Shín'h be repudiated. They pretend that God has commanded recognition of Vice-Regents, executors of His will on earth, and obedience to them.

They believe that God has bestowed on these Vice-Regents (notwithstanding they be sinners treading the paths of error) power and dominion on earth, and that those who acknowledge and follow the Vice-Regents are pardoned their sins through their merits.

The false doctrines also must be shunned of those who assert the Korán to have an outward and apparent, and an inward and hidden meaning, the former known to mankind in general, but the latter only to God's inspired Vice-Regents, by whom it is revealed to their faithful followers. They hold also that God at no time leaves the world without an inspired Vice-Regent. These are the tenets of the Ismá'iliyeh,† a sect of the Ráfidhis. The latter are heretics who deny Abú Bakr and 'Omar, calling them oppressors who kept the rightful heirs from the Imámate. As to the Vicars of God on earth, they believe that a man‡ will appear in the latter days bringing verifications of their sayings. Another sect of errors is needful to be avoided, that of those who, like the Azárekeh,§ assert that persons dwelling in abodes,|| not governed by the rules sent down by God, will not be accepted of God. That their good deeds will not avail them; nor are any such meet for reward: neither are their sins forgiven. They assert that God will not excuse any for remaining therein unless they remove, and that those who die before removal, are infidels. But that those who have removed even though they be murderers or adulterers, or thieves, are Muslims, and have their reward with God, and that in the abode to which they have removed none shall be accounted impious or wicked. It is even as if they were in the house of the apostle of God. These Azárekeh also reject stoning (for adultery) and the beating of the drinker of intoxicating liquor, but allow attack on those who are inimical to their doctrines. These heresies must be avoided.

* The Morjians rely on Faith alone.

† Ismá'ilians, called by the Crusaders "Assassins," from "Hashishín," i. e. eaters of hashish. The word 'assassin' is said to have been so adopted.

‡ i. e. Mahdí.

§ Azrekites so called from Náfá ben Azrek, a sect formerly found at Kuteef.

|| i. e. countries or dwellings of Infidels.

The Ibádhis renounce the false teaching of those who hold that Muslims who commit mortal sins, are to be accounted neither as believers nor yet infidels (but in a middle state), and that God will punish this class of sinners otherwise than infidels are punished.*

The Ibádhi sect oppose their false teaching who say that God is not the author of their actions, but that they themselves originate them, and that God does not guide the believers, nor distinguish them by his guiding mercy; but that guidance to truth and wandering to error are alike optional, to choose which they will, and that God willeth not the actions of his servants, but that they are free to act in opposition to his will. These are the heresies of the Kádriyeh and Mú'tazileh and the like.

It is heresy to assert that God compels his servants to acts of obedience or sin. It is also heresy to assert that God knoweth not all things before they happen, such are the tenets of the Jahmiyeh and the like, which must be avoided. It is needful to renounce and be clear of all who reject the Muslims and scoff at their religion. Also to renounce all who do not take the part of the Muslims† and who do not acknowledge the true "Imám,"‡ or who fail to aid those who do the right whether laid down or not.

The foregoing are the laws and ordinances handed down to us by the just one from another. We do not impose our religion on children of perdition. We do not submit to the guidance of the worldly. We have not derived our belief from the foolish and ignorant.

We have heard the Lord of mankind say in his perspicuous book :—

"All ye who believe, fear God, and be with the just. Take no part with the licentious who work iniquity on earth and prosper not."

We follow the just whose truth is known, and whose justice is renowned; who are of excellent conduct and knowledge, the righteous, pious, and immaculate, excelling in wisdom and nobleness, in probity and integrity: in meekness and humility; who earnestly attend to religious duties and observances, who are in the odour of religious learning, who have made religion manifest to mankind, cleansed it of the impure, and handed it down from generation to generation. We have followed the right with truthfulness and found it the most excellent path.

We announce salvation to those who follow the truth; and woe and ruin to those who swerve from it. To the latter we promise perdition and rejection on the day of judgment; and we seek direction of Almighty God, and I ask forgiveness of Him and repent of all my sins. God bless

* The orthodox hold such persons not to be infidels. The Khárijites considered them infidels. The sect of Mu'tazilites arose holding the middle view.

† Meaning the Ibádhiyeh.

‡ Imám of the Ibádhiyeh.

Muhammad, his chosen apostle, and his family and companions. Blessings on the angels and prophets and all believers from the beginning to the end of time!

2. From Major F. W. Stubbs, Lakhnau, forwarding a copy of the following inscription on the tomb of Shaikh Mīnā, the patron saint of Lakhnau.

شاه مینا نگین خاتم عرش از جهان رفت چون بسوی عدم
گفتم ای خان بسال تاربخش شه مردان و قبله عالم
سنه ۸۸۴

When Shaikh Mīnā, the gem of heaven's ring, left this world for non-existence, I said, "O Friend, the date of his death lies in the words '*Shah i Marḡān u qiblah i 'ālam*' (the king of men, and the cynosure of the world)."

Mr. Blochmann said—

According to the above verse, Shaikh Mīnā would have died in A. H. 884, or A. D. 1479. The biographical works on Muhammadan saints mention A. H. 870, or A. D. 1465, as the year of his death. I extract the following notice from the *Khuzinat ul Aḡfiā* (Láhor Edition, p. 389).

Shaikh Mīnā's real name was Shaikh Muhammad. He was born at Lakhnau, and was brought up by Shaikh Qiwāmuddīn, a dervish of repute. Shaikh Qiwām had a son, named Nizāmuddīn Muhammad Mīnā, who, disgusted with the retired life he had to lead in his father's house, went to Sulṭān Muhammad Shāh, son of Firúz Shāh (1389 to 1391 A. D.), and obtained a lucrative post. His father never forgave him for his worldliness. After several years, he returned to Lakhnau, in order to ask his father's pardon, and in his thoughtlessness he went on horseback into the courtyard where his father's cell was. The father saw him, and said, "Unworthy son, do you dare to come on horseback to the cell of Darwīsh Qiwāmuddīn?" The son pulled back the reins of his horse; but in turning, the horse fell, and he was violently thrown on the ground, and broke his neck. The father looked upon this accident as a punishment inflicted by God on his worldly son, and adopted Shaikh Muhammad, and gave him the name of Mīnā, which his own son had borne. Shaikh Mīnā, in course of time, became a great saint.

A story is told of Shaikh Mīnā to shew that he was marked out a saint from his childhood. When five years old, he was taken to his teacher, and in the beginning of the first lesson, he was asked, according to Muhammadan custom, to say the formula '*Bismillah irrahmān irrahīm.*' After he had repeated the words, he was told to say *A* (*alif*), and when he had done so, to pronounce *Be*. But the boy would not say *Be*; for, said he, "*A* is the first letter of *Allah*, and this is sufficient knowledge." In after-life even, Shaikh Mīnā is said to have frequently expounded the mysteries of the letter *A*.

He did not marry, and lived and died a strict ascetic. He often practised severe penances (*ri'ázat i sháqqah*) and prayed at night sitting on a wall; for should sleep overpower him, he would fall down and thus wake up and continue his prayers. Or he would place thorns and spikes round about himself, so that they might pierce his body, if he should fall down asleep. In winter, he used to put on wet clothes, and stand praying in his courtyard.

Abulfazl in the *Áin* (p. 434, of my text edition), which was written in 1596 A. D., says, 'Shaikh Mírá lies buried at Lakhnau, and people believe that he was a saint.'

Major Stubbs says that the tomb, from which the above inscription is taken, stands on the esplanade of Fort Machhi Bhawan in Lakhnau.

3. From F. S. Growse, Esq., M. A., C. S., Mathurá, forwarding copies of the following Persian and Hindústání Inscriptions on buildings in the city of Mathurá, N. W. P.

I.

بعهد شاه عالمگیر محیی الدین والمله • شهنشاه جهان اورنگزیب معدلت پیرا
بحمد الله نابان است انوار مسلمانی • که از عبد النبي خان شد بنا این مسجد زیبا
بنان را در مسجد آورد این بیت الله ثانی • بدین معنی جاء الحق که باطل گشت ناپیدا
چو جستم سال تاریخش ز فیض حق ندا آمد • بگو عبد النبي خان بانی این مسجد زیبا

1. In the reign of Sháh 'Alamgir Muhsuddín walmillah, the king of the world, Aurangzib, who is adorned with justice,

2. The lustre of Islám shone forth to the glory of God; for 'Abdunnabí Khán built this beautiful mosque.

3. This second 'Holy Temple' caused the idols to bow down in worship. You will now see the true meaning of the text, "Truth came, and error vanished." ["Qorán, XVII, 83."]

4. Whilst I searched for a *táríkh*, a voice came from blissful Truth, ordering me to say 'Abdunnabí Khán is the builder of this beautiful mosque.' A. H. 1071, or 1660-61.

Mr. Growse writes as follows—

'This inscription is over the principal entrance to the Jámí Masjid which stands in the centre of the city on the site of an earlier Hindú temple. The building is of considerable size and has four very lofty minarets, which with other parts of the fabric were once veneered with bright coloured plaster mosaics; but only a few panels now remain, and the whole of the mosque is rapidly becoming a ruin.'

Mr. Blochinann said—

The builder of the mosque, 'Abdunnabí Khán, is known to us from the histories of Aurangzib's age. He is first mentioned as a partisan of Dará Shikoh, and fought against Aurangzib in the battle of Samnagar, near Ágrah (6th Ramazán, 1068, or 28th May 1658; *vide Journal*, A. S. Bengal, 1870, Pt. I., p. 275). About a week after the defeat, he joined Aurangzib's

party, and was immediately afterwards appointed Faujdár of Itáwalí (*‘Alamgirn.*, pp. 96, 115, 127). He retained this office till the 8th Muharram, 1070, or 15th September, 1659, when he was posted to Sirhind, vice Shaikh ‘Abdul Karim Thánészwarí, deceased. His successor at Itáwalí was Firúz Mewáti. ‘Abdunnabi Khán was now a commander of Fifteen Hundred, 1500 horse. He had not been quite a year at Sirhind, when he was sent to Mathurá.

Chaklah Mathurá, from the beginning of Aurangzib’s reign, had been in charge of Ja’far, son of Allah Virdí Khán. Ja’far was a zealous partizan of Aurangzib, because Prince Shujá’ had killed his father. He remained Faujdár till nearly the end of 1070, after having received the title of Allah Virdí Khán, (which his father had enjoyed) and was succeeded by Qásim Khán, who had been Faujdár of Murádábád.* But Qásim was murdered on his way to Mathurá by the brother of his wife, and Aurangzib, in the very end of 1070 (August, 1660), appointed ‘Abdunnabi Khán to Mathurá. He must, therefore, have built the mosque soon after his arrival there. ‘Abdunnabi remained in his office for about nine years, and was killed in the very end of A. H. 1079 (May, 1668). The *Maásir i ‘Alamgirí* (p. 83) has the following passage regarding him and his mosque. ‘On the 21st Zi Hajjah, 1079 [May, 1668], his majesty received a report that ‘Abdunnabi Khán had attacked some rebels that had gathered at Mauza’ Sihora.† He was at first victorious, and succeeded in killing the ringleaders; but in the middle of the fight, he was struck by a bullet, and died the death of a martyr. He was an excellent and pious man, and as courageous in war as successful in his administration. He has left a mosque in Mathurá as a monument, which for a long time to come will remind people of him. Muhammad Auwar, son of ‘Abdunnabi’s brother, received from his Majesty a mourning dress of honor.‡ The property of the deceased lapsed [according to custom] to the state, and the imperial Mutaqaddis reported the seizure of 93,000 gold mulhurs; 1,300,000 rupees; and 1,450,000 rupees worth of property.”

The rebellion in Mathurá district seems to have gained ground. “On the 14th Rajab, 1080, [28th November, 1669], his Majesty left Dihli for Akbarábád, and almost daily enjoyed the pleasures of the chase. On the 21st Rajab, whilst hunting, he received the report of a rebellion having broken out at Mauza’ Rewárah, Chandarkah, and Surkhrú.§ Hasan ‘Ali Khán was ordered

* Murádábád is called in the *‘Alamgirnamah* (p. 126) “a place of disloyalty.”

† The MSS. have *سهره و سوره*. I referred the passage to Mr. Growse who suggests Sihora, “in the Mahában Parganah, a large village which has now a population of 2722 people. It is 5 or 6 miles from Mathurá, across the Jamuná, and adjoins Lohban.” My MS. of the *Tazkiratul-Salásín* has *سهره*.

‡ This shews that ‘Abdunnabi had no sons.

§ MSS. *دسرحون - سرخرو - سرخون*.

to attack the rebels at night, which he did, and the firing lasted till 12 o'clock the next day. The rebels, unable longer to withstand, thinking of the honour of their families, now fought with short arms, and many imperial soldiers and companions of Hasan 'Ali were killed. Three hundred rebels were sent to perdition, and two hundred and fifty, men and women, were caught. Hasan 'Ali, in the afternoon, reported personally the result of the fight, and was ordered to leave the prisoners and the cattle in charge of Sayyid Zain ul-'Abidin, the *jágirdár* of the place. Qaf Shikan Khán also (who after 'Abdunnabi's death had been appointed Faujdár of Mathurá) waited on the emperor, and was ordered to tell off two hundred troopers to guard the fields attached to the villages, and prevent soldiers from plundering and kidnapping children. Námdár Khán, Faujdár of Murádbád, also came to pay his respects. Qafshikan Khán was removed from his office, and Hasan 'Ali Khán was appointed Faujdár of Mathurá, with a command of Three Thousand and Five Hundred, 2000 troopers, and received a dress of honour, a sword, and a horse. * * * On the 18th Sha'bán [1st January, 1670], his Majesty entered Agra. Kokilá Ját, the wicked ringleader of the rebels of District*, who had been the cause of 'Abdunnabi's death and who had plundered Parganah Sa'dábád, was at last caught by Hasan 'Ali Khán and his zealous *peshkár*, Shaikh Razíuddin, and he was now sent with the Shaikh to Agra, where by order of his Majesty he was executed. Kokilá's son and daughter were given to Jawáhir Khán Názir [a eunuch]. The girl was later married to Sháh Qalí, the well-known Chelah; and his son, who was called Fázil, became in time so excellent a Háfiz [one who knows the Qurán by heart], that his Majesty preferred him to all others and even chaunted passages to him. Shaikh Razíuddin, who had captured Kokilá, belonged to a respectable family in Bhágalpúr, Bihár, and was an excellent soldier, administrator, and companion; he was at the same time so learned, that he was ordered to assist in the compilation of the *Futawá i 'Alamgiri* [the great code of Muhammiadan laws]. He received a daily allowance of three rupees."† (*Maásir i 'Alamgiri*, pp. 92 to 94.) Hasan 'Ali Khán retained his office from 1080 to Sha'bán 1087 (October, 1676), when Sulţán Qulí Khán was appointed Faujdár of Mathurá.

It was during the incumbency of Hasan 'Ali Khán that Aurangzib commenced his crusade against Mathurá. There were several imperial villas between Mathurá and Brindában, and as Aurangzib had often stayed there, he must have been well acquainted with the state of Hinduism in the district. The order for the crusade was given in Ramazán 1080, or February, 1669; but no other cause is mentioned except religious zeal. The *Maásir*

* The Bibl. Indica edition of the *Maásir* (p. 93) has Paṭuah—which is wrong. Another MS. has تپسجه. Neither Kháfi Khán, nor the author of the *Tasikratul-Saláfin*, mentions the place.

† The passage in the text edition is corrupt.

says (p. 95)—'During the reign of Jahángir, Bir Singh Deo Bundelá,* the murderer of Abulfazl, had received permission to build at Mathurá an idol house at a cost of 33 lakhs of rupees. This temple was now ordered to be destroyed, and in a short time, with the help of numerous workmen, this seat of error was utterly broken down. Glory be to God that in the present auspicious reign, in which the dens of error and idolatry are destroyed, so difficult an undertaking was successfully accomplished! Seeing the strength of Islám and the power of true piety, the proud Rájás felt their breath burning in their throats, and they were speechless like pictures on a wall. The idols, large and small, which were adorned with costly jewels, were carried away from the temples of these irreligious people, and were taken to Ágrah, where they were buried under the steps of Nawáb Qudsiah Begum's mosque, so that people might for ever trample upon them. "Mathurá itself was henceforth called 'Islámábád.'"

Mathurá is occasionally mentioned in the *Tuzuk* and the *Pádisháhnámah*.

In 1028 [1619, A. D.], one Jadrúp Gosáin had come from Ujjain to Mathurá. This Jadrúp was a famous hermit, and both Akbar and Jahángir had paid him visits. He had now come to Mathurá, in order to worship on the banks of the Jamuná. *Tuzuk*, pp. 175, 279.

In Rabi' I., 1038, Mathurá was given as jágir to Mírzá Isá Tarkhán (*Áin* translation, p. 363). *Pádisháhnámah*, I., 230.

Tigers infested the forests opposite to Mahában, on the other side of the river. Allah Virdi Khán, the Qaríwallbegi, or chief of the Shikáris, reported matters, and Sháhjahán, in 1043, ordered a hunt, and killed four tigers. *Loc. cit.*, I., b., p. 5.

On the 28th Rabi' II., 1045, Murshid Quli Khán was appointed Faujdár of Mathurá and Mahában, and he received orders to punish the rebellious infidels there. This necessitated an increase of his contingent, and he was made a commander of Two Thousand, 2,000 horse. *Loc. cit.*, p. 105.

Sháhjahán in 1048, visited Mathurá again, with a hunting party, and Allah Virdi Khán, "the *tuyáldár*" of the place, was ordered to accompany the emperor as far as Pálan. His eldest son, Ja'far, received a horse as a present, and was sent to the jágir of his father.

In Ramazán, 1049, Aurangzib's wife gave birth to a prince at Mathurá. Sháhjahán gave him the name of Muhammad Sultán.

In 1052, his Majesty heard that Allah Virdi Khán, who could not control his tongue, had given utterance to disloyal opinions. He was now punished and deprived of his jágir and mansab, and was sent to Dihli with orders to stay there; but as his Majesty never forgets old servants, he gave Allah Virdi Khán Parganah Shukrpúr, near Dihli, which had revenue of

* Of Urchah. He is wrongly called in all histories Narsingh Deo.

34 lakhs of dáms (40 dáms = 1 rupee). His jágir at Mathurá and Mahában was given to A'zam Khán.

In 1055, A'zam Khán, on account of old age, did not keep the rebellious inhabitants of Mathurá, Mahában, and neighbouring places, in proper check, though he had his *tuyúl* there, and Makramat Khán, governor of Dihli, who had successfully administered his province, received the Faujdári and Tuyúldári of Mathurá, in addition to his duties and emoluments. *Pádi-sháhnámah* I., 230; I., *b.*, 5,105; II., 23, 111, 170, 309, 425.

Mr. Growse gives another inscription from the same mosque—

این مسجد جامع همایون بنیاد بادا چو دل خدا پرستان آباد
بایع دارن چو همت عشق بلند صحنه دارن چو عرصه فکر کشاد

1. May this Jámí' Masjid, of majestic structure shine forth for ever like the hearts of the pious!

2. Its roof is high like aspirations of love; its courtyard is wide like the arena of thought.

II.

Mr. Growse's second inscription is taken from the centre arch of a small mosque in the Mohanpúr Mahallah—

در زمان شه محمد شاه مسجد عبد الرشید گرد بنا
سال تاریخ او خرد فرمود داد ترتیب مسجد زیبا

1. In the reign of Sháh Muhammad Sháh, 'Abdurrahid built this mosque.

2. Thought suggested the *tárikh*, 'He built a beautiful mosque.' [A. II. 1158; or A. D. 1745].

The builder seems to be unknown, and the composer of the inscription has wisely not mentioned himself; because the first hemistich contains an absurdity in the repetition of the word *Sháh*, and in the second hemistich there is a sad *lapsus metri*, as the letter 'ain in 'Abd-urrahid must be elided. The metre is the *khaṣṣif*.

The following two inscriptions from Mathurá belong to the present century—

III.

هوالمستعان العباد

شد جدید آثار نام نیک این دیر قدیم * در سواد شهر مهترا تیرنگ هر شش جهات
چون بنا فرمود معبد کهنه شرتال نام * بانی جود و عنایت منتهای محسنات
فیض بخش اهل عالم مرجع احسان عام * راجه پدنی مل بهادر منبع عالی صفات
یکهزار و دوصد و بیست و دو آمد در شمار * سال تعمیرش برای یاد کار کاینات
در حساب الهی هم سال تاریخ از ذکا * می شود این بیگمان هر شهر (؟) آب حیات
سنه ۱۲۲۲ هجری

Mr. Growse says that the inscription is taken from the Goghát of the Siva Tál, a large tank of very handsome architectural design, constructed by Rájá Patní Mal, in 1807 A. D.

The last line is not clear. The metre is Long Ramal.

IV.

جو بس سرکار کو منظور آرام خلیق تھا • کیا با صاحب کیلکٹر و میجسٹریٹ ایما
اونہون نے تب رئیسوں کی مددگاری سے بہتر امین • مہذت (۶) کام کا نادر مسافر خانہ بنوایا
صفائی میں درو دیوار ہی مانند آئینہ • بلکاری ہر ایک درجہ نظر انا ہی گلشن کا
بعد اعتدال اب اسنی پائی رفعت و وسعت • بہت خوش قطع اور موزون ہی یہ تعمیر سرتاپا
روا ہی گرفتارین گنبد افرا • یاب اسکو • بجائی جو کہیں اسکو کہ ہی یہ قصر قد صرکا
جو دیکھا اسکو شوکت نے یہ تاریخ بنا لکھی • مسافر خانہ موزون ہی بس رشک چمن زیبا
سنہ ۱۲۶۴ قسلی سنہ ۱۸۵۶ عجمی

Mr. Growse says:—‘ This inscription is in Hindústāni, and is worked into the cornice of the central hall of a very elegant and elaborate building, erected by public subscription at the suggestion of Mr. Mark Thornhill, Collector of the district in 1856. It was intended as a rest-house for native gentlemen of rank, but has never yet been used for any purpose whatever. Indeed, though a good specimen of stone-carving, an art for which Mathurā is famous, it is too delicate a work to be converted to any practical use except as a local Museum.’ The metre of the Inscription is *Long Hazaj*. The second line is not clear.

The following papers were read—

1.—*General Cunningham's Bengal Inscriptions (Muhammadan Period).*—

By H. BLOCHMANN, M. A., *Calcutta Madrasah.*

(Abstract.)

General Cunningham has sent to the Society a large number of Sanskrit and Muhammadan inscriptions for publication. The former have been taken charge of by Bābus Pratāpachandra Ghosh and Gaur Dās Baisākh, the latter I have myself taken in hand. The Sanskrit inscriptions, 29 in number, are mostly from Bihār. A few of them have been deciphered. The Muhammadan inscriptions consist of 39 rubbings from Dihli, Ajmir, Badāon, Biānah, Fich, Kananj, and other places in the North-West; and of 65 from various places in Bengal and Bihār.

It is my intention to give the members of the Society an account of the use which I have made of this splendid collection; and I shall give this evening a short *resumé* of the important contributions to our knowledge of Bengal history, which my readings have yielded. The Society owes a debt of gratitude to General Cunningham for the disinterested readiness with which he has placed a truly unique collection of rubbings at our disposal for publication in the Journal.

I have often drawn the attention of the members to the unsatisfactory state of our knowledge of the Muhammadan Period of Bengal History. Though there can be no doubt that the courts of the independent kings of Bengal attracted writers of distinction, not a single

work dealing exclusively with Bengal history, has come down to us. Whatever we know we glean from incidental remarks made by the historians of the Dihli empire, or from the meagre extracts given in the *Ṭabaqāt i Akbarī* and *Firishtah*. *Firishtah*, a Dak'hin writer of the beginning of the 17th century, copied partly from the *Ṭabaqāt*; but either work contains information not given in the other, and I hope to give with General Cunningham's inscriptions a comparative analysis of both sources.

Besides the *Ṭabaqāt* and *Firishtah*, we have in the *Ṭabaqāt i Nāqirī* valuable notes on the Muhammadan governors that ruled in Gaur or Lakhnautī, after the overthrow of the last Hindú king of Bengal by Bakhtyār Khilji in 1203. This source has been completely used by Mr. E. Thomas. Lastly, we have a modern history of Bengal, entitled *Riyāzussalāṭīn*, written by Ghulam Husain, poetically styled Salīm, of Zaidpūr, and completed (as indicated by the title, which is a *tārīkhī* name) in A. H. 1202, or A. D. 1787-88, at the request of Mr. George Udney of MálDAH. Stewart's 'History of Bengal' is based upon this work. The Persian text has not been printed; but a critical examination would be desirable. Salīm must have had access to works that no longer exist, for he gives details not to be found in the *Ṭabaqāt* or *Firishtah*.

These are the only written sources which we possess of the history of the governors and independent kings of Bengal, *i. e.* for a period of 335 years, from 1203 to 1537, A. D. Our knowledge, therefore, is entirely derived from mere extracts and second-hand compilations, and it is no wonder that for several portions of that period we have no guide. The importance of Bengal coins and inscriptions thus becomes apparent.

Bengal coins have hitherto received more attention than inscriptions. Marsden, in 1823, and Laidley (a former Secretary of the Society) in 1846 published Bengal coins, which for the first time revealed the importance of their testimony. But far greater results were obtained by Mr. E. Thomas, who examined the selections made from the 13,500 pieces of silver, which in August 1863 were found in Koch Bihár. His contributions, which refer to the years from 1203 to 1357 A. D., are the most important that have hitherto been made to Bengal History. For the remaining portion of the above period, *viz.*, from 1357 to 1537 A. D., the coins have not yet been examined; these scientific treasures lie still buried in public and private coin-cabinets.

The most obscure portion of Bengal history, at the present stage of research, extends over more than sixty years, from 1385 to about 1450 A. D. To this time belong the usurpation of the throne by a Hindú Rájá, hitherto called Kanis or Kansa,—a corruption, as it would seem, of 'Ganesha',—and the reigns of his son and grandson, who turned Muhammadans. Whether Ganesh himself became a Muslim, has not yet been proved.

To the same period also belong two invasions of Bengal, one from the west, undertaken by the kings of Jaunpúr; the other from the east by the Ahoms of Ásám, who under Chadangpha in 1414 extended their conquests to the Karataya river (Dínájpúr and Rangpúr). Whether Bengal Proper was made wholly or partially tributary to Jaunpúr is not certain; but it is clear from South Bihár inscriptions that the whole of Bihár was annexed to Jaunpúr. The power of the kings of Bengal, therefore, in the first half of the 15th century must have been reduced to a minimum.

No inscriptions belonging to this dark period of Bengal history have hitherto turned up; and it seems as if coins alone could give the wanting information. For the clearing up of the final portion, from 1450 to 1537, A. D., though the coins have not yet been examined, many inscriptions have now come to hand; and it may reasonably be hoped that future discoveries of inscriptions will clear up the few doubts that are left.

Numerous as the inscriptions in Bengal appear to be, it seems strange that so few have hitherto found their way into our Journal. In fact, with the exception of three inscriptions given in the Journal for 1847, 1861, and 1867, I know of no others that have been published. In 1870, I invited members of the Society to forward rubbings to Calcutta, and valuable Bengal inscriptions have since been received from Mr. E. V. Westmacott, Dr. J. Wise, and Mr. Walter M. Bourke, which together with General Cunningham's collection amount to about 120. Last month also I received from Bábu Rájendralála Mitra an interesting rubbing from Rájsháhí, which makes mention of a rebel king, who, in 1581, attempted to establish himself.

Of all these inscriptions a few are useless, being quotations from the Qorán; and about one-fourth refer to the 17th century, and are, therefore, of less importance. Of General Cunningham's 65 Bengal inscriptions, 3 are illegible, 19 are useless, 14 are of minor interest, and 28 are excellent.* Twenty-three of them come from Panduah near Maldah, which place General Cunningham, from the fact of its having once been the capital of Bengal, significantly calls 'Hazrat Panduah,' to distinguish it from Panduah in Húglí District; 20 come from Gaur; 1 from Maldah; 1 from Munger; 1 from Rájmahall; 1 from Lakkí Sarai; 4 from Sâtgaón; 2 from Panduah in Húglí; and 12 from Sunnárgaón and Dháká District. They are nearly all inscriptions from old mosques.

The historical value of all Bengal inscriptions received by the Society

* One (marked 37) has not yet been received. Useless are Nos. 2, 9, 10, 13, 14, 15, 17, 31, 32, 33, 34, 35, 36, 40, 43, 44, 46, 53, and Sunnárgaón (K). Illegible are Nos. 28, 39, and Sunnárgaón (G). Of little interest are 11, 12, 16, 18, 19, 20, 21, 22, 23, 24, 29, 38, and Sunnárgaón, (J,L). Good are Nos. 1, 3, 4, 5, 6, 7, 8, 25, 26, 27, 30, 41, 42, 45, 47, 48, 49, 50, 51, 52, and the Sunnárgaón rubbings marked A, B, C, D, E, F, H, J. Some of them have since been published.

inclusive of those that have been published, may be estimated from the following considerations :

1. They confirm numerous facts given in the histories or elucidated from coins.
2. They give the full names of fourteen kings.
3. They shew that the governors of Bengal were also governors of Bihár.
4. They mention a new prince, Hátim Khán, son of Fírúz Sháh (I).
5. They prove that Sikandar Sháh reigned in 770 A. H., whilst the histories say that he died in 769 A. H.
6. They shew that Náṣiruddín Mahmúd Sháh (I) reigned in 861, and continued to reign till the beginning of 864.
7. That Fath Sháh reigned in 886, whilst the histories commence his reign a year later.
8. That Muzaffar Sháh reigned in 898, whilst the histories commence his reign two years later.
9. They mention a new king, 'Aláuddín Fírúz Sháh.

That is, the inscriptions hitherto received, besides affording valuable testimony to the correctness of facts known before, reveal one new king, one new prince, and correct the chronology of the reigns of six kings of Bengal.

The following is a list of Bengal inscriptions, published or about to be published. General Cunningham's inscriptions are marked [G. C.]

1. 'Izzuddín Abul Fath Tughril, governor of Lakhnauti.
 1. *Bihár* ; Muharram, 640, or July 1242, A. D. Plate published in *Journal*, A. S. Bengal, 1871, Pt. I, Pl. vii.
 2. Ruknuddín Kai Ka'us.
 1. *Gangardimpúr*, 1st Muharram, 697, or 19th October, 1297 ; published in *J. A. S. B.*, 1872, p. 103.
 2. *Lakkhi Sarái*, same date. [G. C.]
 3. Shamsuddín Abul Muzaffar Fírú'z Sha'h.
 1. *Bihár*, A. H. 709 ; plate published in *J. A. S. B.*, for 1871, Pt. I, Pl. viii.
 2. *Tribení* ; 1st Muharram, 713, or 28th April, 1313. Published, *J. A. S. B.*, 1870, Pt. I, p. 287.
 3. *Bihár*, 1st Rajab, 715, or 1st October, 1315.
- Fírúz Sháh's son, Hátim Khán, governor of Bihár.
Bengal under Dihli. Muhammad bin Tughluq, 732. *Bihár*.
4. Abul Muja'hid Sikandar Sha'h, son of Ilyás Sháh.
 1. *Dindjipúr*, A. H. 765, or A. D. 1363-4 ; published, *J. A. S. B.*, 1872, p. 105.
 2. *Hazrat Panduah*, 6th Rajab, 770, or 14th February, 1369. [G. C.]

5. Na'siruddi'n Abul Muzaffar Mahmu'd Sha'h (I).

1. *Sâtgaón*; A. H. 861, or 1457. Published, J. A. S. B., 1870, p. 293. The inscription does not contain the word 'Mahmúd.' The letters are broken off, and my reading 'Husain Sháh', to judge from inscriptions since published, is to be corrected to 'Mahmúd Sháh.'

2. *Dháká*, 20th Sha'bán, 863, or 13th June, 1459. Published, J. A. S. B., 1872, p. 108.

3. *Gaur*, 28th Zil Hajjah, 863, or 26th October, 1459. [G. C.]

6. Ruknuddi'n Abul Muja'hid Ba'rbak Sha'h, son of Mahmúd Sháh.

1. *Tribení*; 1st Muharram, 860, or 11th December, 1455. Bárbak is styled 'Malik,' not Sultán; hence he was, in 860, governor of South-Western Bengal. Published, J. A. S. B., 1870, Pt. I, p. 290.

2. *Dínájpúr*, 16th Çafar, 865, or 1st December, 1460.*

7. Shamsudd'in Abul Muzaffar Yu'suf Shah, son of Bárbak Sháh.

1. *Panduah*, 1st Muharram, 882, or 15th April, 1477. [G. C.]

2. *Hazrat Panduah*, 20th Rajab, 884, or 8th October, 1479. [G. C.]

3. *Gaur*, 10th Ramazán, 885, or 13th November, 1480. [G. C.]

8. Jala'luddi'n Abul Muzaffar Fath Shah, son of Mahmúd Sháh (I).

1. *Dháká*, 1st Zil Qa'dah, 886, or 2nd January, 1482.†

2. *Dhámraí*, 10th Jumáda I., 887, or 27th June, 1482. Published, J. A. S. B. 1872, p. 109.

3. *Bikrampúr*, middle Rajab, 888, or August, 1483. [G. C.]

4. *Sunnárgáon*, Muharram, 889, or beginning of A. D. 1484. [G. C.]

5. *Sâtgaón*, 4th Muharram, 892, or 1st January, 1487. Published, J. A. S. B., Pt. I, 1870, p. 294.

9. Na'siruddi'n Abul Muja'hid Mahmu'd Shah (II).

1. *Hazrat Panduah*. Date illegible. [G. C.] This king differs slightly from No. 5, in the *julús*-name. His name renders the statement of Háji Muhammad Qandahárá probable that he was the son of Fath Sháh; for grandsons often bear the names of their grandfathers.

10. Shamsuddi'n Abul-Nasr Muzaffar Shah.

1. *Hazrat Panduah*, 18th Ramazán, 893, or 5th July, 1493. [G. C.]

2. *Dínájpúr*, Rajab, year illegible. Published, J. A. S. B., 1872, p. 107, where the *julús* name is wrong, the error having been corrected in the errata.

11. 'Ala'uddi'n Abul Muzaffar Husain Shah, son of Sayyid Ashraf.

1. *Munger*, 903; mentions Prince Dányál. Published Journal, 1872, p. 334.

2. *Dháká*, 907, [G. C.]

3. *Bonhara*, in Bilhár, 908. Published, 'Proceedings' 1870, p. 112.

* Received with a note from E. V. Westmacott, Esq., C. S.

† Received from Dr. J. Wise, Dháká.

4. *Cheran*, in Bihár, 909. Published, Proceedings 1870, p. 297.
5. *Múldah*, 911. [G. C.]
6. *Hazrat Panduah*, 915. [G. C.]
- 7 to 9. *Gaur*, two of 916, and one of 918. [G. C.]
10. *Sunnárgáon*, 2nd Rabi' II., 919, or 8th May, 1513. [G. C.]
Published, Journal, 1872, p. 333.
11. *Bírbhám*, 922. Published, Journal, 1861, p. 390.
12. *Sunnárgáon*, 15th Sha'bán, 925, or 12th August, 1519. [G. C.]
13. *Gaur*, 925, or A. D. 1519. Published with plate, J. A. S. B., 1871, Pt. I, p. 256.
12. Na'siruddi'n Abul Muzaffar Nusrat Sha'h, son of Husain Sháh.
1. *Sunnárgáon*, 929, or 1523. [G. C.] Published, Journal, 1872, p. 338.
2. *Sátgáon*, Ramazán, 936, or May, 1529. Published, Journal, 1870, p. 298.
3. *Gaur*, Qadam Rasúl, 937, or 1530-31. [G. C.]. Published, Journal 1872, p. 338.
13. 'Ala'suddi'n Abul Muzaffar Fí'ru'z Sha'h, son of Nuçrat Sháh.
1. *Kalnah*, 1st Ramazán, 939, or 27th March, 1533. Published, Journal, 1872, p. 332.
14. Ghia'suddi'n Abul Muzaffar Mahmu'd Sha'h (III.) son of Husain Sháh.
1. *Gaur*, Sa'dullabpúr, 941, or 1534-35, [G. C.]. Published Journal, 1872, p. 339.

2.—Description of a remarkable new species of *Molossus* (*Nyctinomus*), from Johore in the Malay Peninsula;—by G. E. DOBSON, B. A., M. B.

The following description of a very interesting new species of *Molossus* is taken from a single male specimen, preserved in spirit, which was obtained by Mr. Wood-Mason's private collector at Johore.

Molossus (*Nyctinomus*) *Johorensis*, n. sp.

Ears large, circular, as in *Nyc. plicatus*, Buch. Ham.; united in front; antitragus large, separated from the outer margin by a deep concavity; tragus very small, square, superior margin slightly concave. In front, the inner sides of the ears are connected by a fold of integument passing forwards on the muzzle as far as a point placed mid-way between the eyes and the extremity of the nostrils. This connecting band is continued upwards and backwards, between the ears, to a height of 0·4 inch, forming a small funnel open behind, wide below and narrow above. At a distance of about 0·3 inch from the anterior connecting band the ears are again connected by a second fold of skin posterior and parallel to the first, about

0.1 inch in vertical height. Between these two connecting folds of integument and the sides of the ears a hollow square is contained. This concavity is empty and open only from above. At the base of the funnel shaped anterior boundary a few long hairs exist, similar to those found at the bottom of the frontal sac of some species of Phyllorhine Bats. The remaining portions of the cell and its boundaries are naked.

The animals of this genus possess the power of folding the ear conch forwards, downwards, and outwards, thus closing the external ear; when the ears are closed the funnel shaped portion of integument connecting them in front, in this species, is drawn forwards disclosing the cavity behind. In the erect condition of the ears the same funnel shaped projection is drawn backwards across this square hollow cavity, which it covers, as the pitcher of *Nepenthes* is covered by the leaf forming its lid. In this position the extremity of the funnel is flattened out, and lies in the space contained between the posterior connecting band and the top of the head.

In other respects this species resembles *Nyc. plicatus* very closely. The thumb is longer than in most species of the genus; and the wing membrane is attached a short distance below the knee joint.

Dentition—in. $\frac{2}{4}$; c. $\frac{1-1}{1-1}$; p. m. $\frac{2-2}{2-2}$, m. $\frac{3-3}{3-3}$.

The upper incisors are placed in the centre of the space between the canines, and are separated by a very narrow interval from each other. Length, head and body 2.8 inches; tail 1.7; tail free from interfemoral membrane 1.0; ear, 0.9; tragus 0.1; forearm 1.9; thumb 0.5; second finger 3.6; fourth finger 1.8; tibia 0.7; foot and claws, 0.4.

3.—On a double-headed snake presented to the Indian Museum by Dr. R. F. Thompson, Civil Surgeon, Hughli;—By G. E. DOBSON, B. A., M. B.

(Abstract.)

Dr. Dobson exhibited, on behalf of the donor, a very remarkable double-headed monstrous form of snake (*Lycodon aulicus*).

The specimen appears rather to represent two snakes fused into one at a short distance behind the neck, as each head is perfect, and is joined by a distinct neck with the body which soon becomes connected with the body of the other snake. The twin bodies are connected, before becoming completely united, by a band of skin about mid-way between the posterior extremity of the head and the point of complete union in one body. Total length of the specimen, measured from the snout of one snake to the tip of the tail, 7.3 inches; snout to point of complete union 0.9 inches.

The only other specimen of double-headed snake in the Indian Museum was sent to the Museum of the Asiatic Society by the Nawab of Dacca many years ago. It is a specimen of *Naja tripudians* about 18 inches long

with a second head nearly as large as the first, placed at right angles to the body, on the right side, at the posterior extremity of the first head which is directly continuous with the body.

The paper will be published in the Journal as soon as the plate to accompany it is ready.

LIBRARY.

The following additions have been made to the Library since the last meeting.

Presentations.

* * Names of Donors in Capitals.

Bulletin de la Société de Géographie, Juillet, Aout, 1872.

Jules Girard.—Essai d'orographie sous-marine de l'Océan Atlantique méridional
Dr. Martin.—Sur la statistique relative au dénombrement de la population en Chine.

SEPTEMBER, 1872.

Positions occupées pendant l'été par les Turkomans Yomouds nomades.—Exploration en Chine par le baron de Richthofen. *Charles Grad.*—Les Colonies Hollandaises des Indes Orientales par F. de Hellwald.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Bulletin de la Société Impériale de Naturalistes de Moscou, No. 1, 1872.

O. de Bourmeister Radoszkowsky.—Supplément indispensable à l'article publié par M. Gerstaecker en 1869 sur quelques genres d'hyménoptères. *Eugene de la Rue.*—Observations sur la phyllomorphose du *Syringa vulgaris*, &c. *G. Milachewitch.*—Remarques sur la structure de la columelle de *Lonsdaleia*.

THE IMPERIAL SOCIETY OF NATURALISTS OF MOSCOW.

Monatsbericht, Juli, 1872.

H. Rammelsberg.—über die unterphosphorigsauren salze. (The author treats of the reduction of metals by these salts.)

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN.

A Geographical and Statistical Report of the Dinagepore District.—By Major J. L. Sherwill.

Statistical and Geographical Report of the Moorshedabad District.—By Capt. J. E. Gastrell.

Geographical and Statistical Report of the District of Beerbhoom.—By Capt. W. S. Sherwill.

Geographical and Statistical Report of the District of Tirhoot.—By A. Wyatt, Esq.

Geographical and Statistical Report on the District of Tipperah.—By R. B. Smart, Esq.

Geographical and Statistical Report on the District of Fyzabad.—By Lieut. F. Coddington.

Statistics of the District of Sarun, consisting of Sircars, Sarun and Chumparun.—By A. Wyatt, Esq.

Geographical, Statistical and General Report on the District of Hazarcebaugh.—By Capt. G. Hunter Thompson.

Statistics of the District of Patna.—By the Revenue Surveyor.

Report on the survey of the Derah Ghazee Khan District.—By Capt. H. C. Johnstone.

Geographical and Statistical Report of District Mahomed Khan's Tanda of the Hyderabad Collectorate, Province of Sind.—By Capt. D. Macdonald.

Statistics of the District of Behar.—By Capt. Sherwill.

Statistics of zillah Midnapoor.—By J. S. Torrens, Esq.

Statistics of the zillah of Shahabad.—By W. Travers, Esq.

SURVEYOR GENERAL'S OFFICE, CALCUTTA.

The Christian Spectator. January, 1873.—THE EDITOR.

Rámáyana, edited by Hem Chandra, Vol. III. No. 3.—THE EDITOR.

The Rajas of Rajashahi, by Bábu Kissory Chand Mitra.—THE AUTHOR.

Purchase.

Comptes Rendus, Nos. 16-18, 1872.

No. 16.—*M. Tresca*.—Relevé méthodique des résolutions de la commission internationale du Mètre, réunie à Paris en 1872. *M. Ch. V. Zenger*.—Sur l'action des conducteurs disposés symétriquement autour d'un électroscope. *M. M. Schützenberger et Gérardin*.—Sur un nouveau procédé de dosage de l'oxygène libre.

No. 17.—*M. Yvon Villarceau*.—Note accompagnant la présentation d'un Mémoire et d'une lettre de M. de Magnac, sur l'emploi des chronomètres en mer. *M. A. Caligny*.—Théorie de plusieurs systèmes d'écluses de navigation. *M. C. Sédillot*.—Sur les phénomènes de fermentation et leurs rapports avec la physiologie pathologique, à propos des études récentes de M. F. Monoyer sur la Zymologie. *M. C. Dareste*.—Etudes sur les types ostéologiques des poissons osseux.

No. 18.—*M. J. Boussinesq*.—Essai sur la théorie des eaux courantes. *M. C. Dareste*.—Etudes sur les types ostéologiques des poissons osseux (2e partie). *M. M. A. Rabuteau et F. Papillon*.—Recherches sur les propriétés antiseptiques et l'action physiologique du silicate de soude. *M. Rabuteau*.—Recherches chimiques sur les feuilles de l'Eucalyptus globulus. *M. Jacques*.—Ouverture de deux plis cachetés, concernant la conservation des matières animales au moyen du borate de soude et des borates en général.

Annals and Magazine of Natural History. November, 1872.

Rev. T. Hincks.—On the Hydroid *Lar anbellarum*, Gosse, and its reproduction. *F. P. Pascoe*.—Notes on Coleoptera, with description of new Genera and species Part II. *Dr. J. E. Gray*.—Notes on the Mnd-Tortoises of India. *J. F. Whiteaves*.—Notes on a deep-sea Dredging Expedition in the Gulf of St. Lawrence. *A. G. Butler*.—Description of new Myriopoda of the family *Glomerida*. *O. Schmidt*.—On Coccoliths and Rhabdoliths. *Dr. A. Günther*.—Notes on a new species of Lizard from North Australia. *T. A. Verkräzen*.—Dredging Excursion to Iceland in June, July, 1872. *Prof. S. Lovén*.—On the structure of the Echinoidea. *Rev. T. Hincks*.—Contributions to the History of the Hydroids. *Rev. T. Hincks*.—On Campy-onema a new genus of Polyzoa. *Dr. A. Günther*.—Notice of some species of fishes from the Philippine Islands. *E. Blyth*.—On the species of Asiatic two-horned Rhinoceros.

Revue et Magasin de Zoologie. No. 9. 1871-1872.

J. Vian.—Causeries ornithologiques. Dr. Rousseau.—Études des genres *Teinostoma*, *Cyclostrema* et *Skenea* (mollusques). H. Tournier.—Catalogue des Longicornes récoltés par M. Th. Deyrolle en Imirétio, Mingrélie et Géorgie. Dr. Dours.—Hyménoptères nouveaux du bassin méditerranéen.

Revue des deux Mondes, 1er Novembre, 1872.

M. Mazime du Camp.—Les Aliénés à Paris—II—Les Asiles, La Sureté à Bicêtre.

Journal Des Savants, Octobre, 1872.

De Quatrefoies.—Les races de l'archipel Indien. J. Bertrand.—Théorie mathématique de l'électricité. Dulaurier.—Historiens anciens et modernes de l'Arménie.

The Indian Annals of Medical Science. No. 30. 1873.

The Calcutta Review. No. 111. January 1873.

Revue Archéologique, October, 1872.

E. von Harold's Coleopterologische Hefte. VIII.

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR FEBRUARY, 1873.

The Annual meeting of the Society was held on Wednesday, the 5th of February, 1873, at 9 o'clock P. M.

T. Oldham, Esq., LL. D., President, in the chair.

According to the Bye-Laws of the Society, the President ordered voting papers to be distributed for the election of Officers and Members of Council for 1873, and appointed Mr. F. W. Peterson and Dr. Waldie, scrutineers.

The President then called upon the Secretary to read the Annual Report.

ANNUAL REPORT FOR 1872.

In presenting the Annual Report for 1872, the Council, while regretting that the financial resources of the Society have not increased so much as could have been wished, have, however, the satisfaction of congratulating it on an undiminished career of usefulness as evinced by the amount of its publications and the number of admissions of new members.

At the close of 1871, there were 446 Ordinary members, of these 286 were paying (112 being resident in Calcutta and 174 in the mofussil) and 160 absent from India.

During the year under review 32 new members have been elected, but only 25 of these have paid in their admission fees, and have been entered in the member list, whilst the Society has sustained a loss of 28 Ordinary members, viz., 18 by resignation, 2 by cancelling and 8 by death.

The total number of Ordinary members at the close of 1872 is thus shewn to be 443, or three members less than at the end of the previous year. But in the member list for 1872, published with the Proceedings for February last, the names of five gentlemen* were retained although they had not till then paid in their admission fees; and according to rule 5 of the Bye-laws their election has become null and void.

The actual total for the year is thus reduced to 438. Of which number 277 are paying members, (105 resident in Calcutta, 172 in the mofussil,) 159 are absent from India and 2 are life members, thus showing a sensible decrease in the number of paying members.

The following table exhibits the number of paying and absent members for the last 10 years.

Year.	Paying		Absent.	Total.
	Resident.	Non-Resident.		
1863	276 (180,	146)	79	355
1864	228 (183,	195)	92	320
1865	267 (186,	131)	109	376
1866	293 (124,	169)	94	387
1867	307 (154,	153)	109	416
1868	294 (159,	135)	133	427
1869	304 (162,	142)	138	442
1870	266 (134,	132)	148	414
1871	286 (112,	174)	160	446
1872	277 (172,	105)	2L.M. 159	438

Two Honorary members were elected during the year, *viz.* Professors G. B. Airy and T. Huxley.

The Council regret to announce the deaths of C. Horne, Esq., C. S. Rev. J. Roberts, W. Abbey, Esq., Dr. T. C. Jerdon. Hon'ble Sir D. F. Macleod, C. B., K. C. S. I. Captain A. B. Melville, J. W. Laidlay Esq., and Sir W. Denison, K. C. B., Ordinary members; also of Dr. T. Goldstücker who was a corresponding member of the Society, and Col. W. H. Sykes F. R. S., an Honorary member.

The Society had the misfortune to lose their late Patron, the Right Hon'ble, the Earl of Mayo, who was assassinated in March. On the arrival of H. E. the present Viceroy, Lord Northbrook, the vacant office was tendered to him and graciously accepted.

Museum.

The Council continue to carry out the provisions of Act XVII of 1866 and transfer all Natural History and Archæological donations received by them to the Trustees, Indian Museum. A list of these donations is given in the Appendix to the Proceedings.

* Raja Amir Husain Khan Bahadur, C. F. Bligh, Esq., C. F. Daukes, Esq., G. C. Farr, Esq., J. O'Kinealy, Esq.

The Trustees on the part of the Society were Mr. W. S. Atkinson, Mr. H. F. Blanford, Dr. F. Stoliczka and Col. J. E. Gastrell, who is to hold the office during the period the Superintendent of the Geological Survey continues President of the Society.

Finance.

The actual total receipt by subscriptions from members during the year under review amounts to Rs. 7,551, against Rs. 8,516 of the previous year. The amount due from members on account of subscriptions is Rs. 5,685 against Rs. 5,200 of the previous year and the Council would again earnestly urge on members the importance of punctual payments of their subscription, and the early paying up of all arrears.

The following table exhibits an abstract of the accounts for 1872.

ACTUAL INCOME DURING 1872.

Subscriptions,	Rs. 7,551	0	0
Admission fees,	708	0	0
Publications,	1,276	8	9
Library,	277	2	0
Secretary's office,	19	11	0
Vested Fund,	108	14	0
Sundries,	748	14	3

Rs. 10,750 2 0

Balance in the Bank of Bengal,	2,236	5	7
Cash in hand,	216	14	3

Rs. 13,203 5 10

EXPENDITURE DURING 1872.

Publications,	Rs. 6,703	8	2
Library,	1,344	4	3
Secretary's office,	2,520	0	1
Vested Fund,	0	4	4
Building,	853	7	3
Coin Fund,	135	11	0
Sundries,	734	10	3
Balance in the Bank of Bengal,	767	9	4
Cash in hand,	143	15	2

Rs. 13,203 5 10

The expenditure for 1872 has slightly exceeded the estimate, but has been considerably in excess of the income as will be seen from the following table.

	INCOME.		EXPENDITURE.	
	Estimate.	Actual, 1872.	Estimate.	Actual.
Subscriptions,	8,500 0 0	7,571 0 0	0 0 0	0 0 0
Admission fees,	1,000 0 0	768 0 0	0 0 0	0 0 0
Publications,	1,500 0 0	1,276 8 9	5,000 0 0	*6,703 8 2
Library,	250 0 0	257 2 0	2,150 0 0	†1,344 4 3
Coin Fund,	0 0 0	0 0 0	100 0 0	135 11 0
Secretary's office,	0 0 0	19 11 0	3,000 0 0	2,520 0 1
Building,	0 0 0	0 0 0	1,000 0 0	853 7 3
Sundries,	800 0 0	793 5 3	800 0 0	709 8 3
Rs....	12,050 0 0	10,685 11 0	12,050 0 0	12,266 7 0

The following is the estimated income and expenditure for 1873.

ESTIMATED INCOME FOR 1873.

Subscriptions,	Rs. 7,500 0 0
Admission Fees,	750 0 0
Publications,	1,200 0 0
Library,	250 0 0
Sundries,	750 0 0
Coin Fund, Secretary's office, Building,	0 0 0
Rs.	10,450 0 0

ESTIMATED EXPENDITURE.

Subscriptions,	Rs. 0 0 0
Publications,	3,050 0 0
Secretary's office,	2,600 0 0
Sundries,	800 0 0
Building,	1,000 0 0
Coin Fund,	0 0 0
Library,	3,000 0 0
Rs.	10,450 0 0

* For further particulars see Appendix (1).

† This does not represent the actual cost of the Library for the year. It is for keeping the Library establishment and for binding books, but the greater portion of the periodicals are lying unbound for want of sufficient funds. The cost of books purchased from Messrs. Williams and Norgate and Trübner is represented under liabilities.

Library.

The Library received, in 1872 an addition of 859 volumes or parts of volumes. The greater portion of this addition is made up by donations from the Government and by exchanges with other Societies.

In order to increase the usefulness of the library lists, the Council have directed that an abstract of the titles of articles in the various journals and other works received by the Society, likely to be of interest to the members of the Society, may be printed in the Proceedings.

The collection of MSS. received an addition of 104 Sanskrit MSS. purchased by Bābu Rājendralāla Mitra and 4 MSS. copied for the Society.

The Photographic Album of the Society has received 2 photographs of Lushai arms and utensils from the Surveyor General's Office.

The English Agency of the Society has been transferred to Messrs. Trübner and Co. in place of Messrs. Williams and Norgate.

The want of proper accommodation for the Society's Library continues to be very severely felt and the Council fear that under the present state of things it will be in vain to hope for any increase in its prosperity or in the enlargement of its scope of usefulness. In reply to the application to Government for the sum of Rs. 400 monthly to cover the rent of the Society's house during the occupation of the present Building by the Indian Museum, the Society has been informed that the matter is under the consideration of Government, but it is confidently hoped that a favourable reply will soon be received.

Coin Cabinet.

During the year 19 silver, several Bactrian copper coins and 8 tin coins have been received as donations from members of the Society and others. 29 silver Bactrian coins have been purchased at Rs. 110 by the Society.

Journal.

About 400 pages of the Journal, Part I, have been printed during the year, and they have been illustrated by 16 lithographic plates. 300 pages of Part II have been published with 11 plates, and 212 pages of the Proceedings with 3 plates. The size of the Journal has been increased and the additional cost of the change has added considerably to the expenses under this head.

Bibliotheca Indica.

The Council have the pleasure to announce that the progress made in the publication of Oriental works during the past year has been in every respect satisfactory. The work done comprises 18 fasciculi of Sanskrit works, 6 fasciculi of Persian works (including a double number) and 3 fasciculi of translations from the Persian.

SANSKRIT.

The eighteen fasciuli of the Sanscrit Series comprise portions of eleven different works ; four relating to the Sama Veda, three to the Yajur Veda, two to the Atharva Veda, and one each to the Smṛiti and Chhandas.

Professor Mahesachandra Nayayaratna has completed the 4th volume of the Saṁhita of the Black Yajur Veda, and is now employed on the fifth. The work comprises eight books, of which the first was edited by the late Dr. Roer, the second by Professor Cowell, and the major portion of the third by the late Paṇḍit Rāma Nārāyaṇa Vidyaratna, on whose death the present editor took the work in hand. The last three books are short, and it is expected that one volume more will complete the undertaking.

Bābu Rājendralāla Mitra has brought to a conclusion his edition of the Taittiriya Aranyaka, on which he had been engaged for the last seven or eight years. It extends to 928 pages of text, 77 pages of Introduction, and 56 pages of a Table of Contents. The Introduction gives a complete analysis of the work in English, and the table of contents notices the subjects of the mantras seriatim.

The Gopatha Brāhmaṇa of the Atharva Veda, which was originally undertaken by the late Paṇḍit Harachandra Vidya Bhushana, and on his death made over to Bābu Rājendralāla Mitra, has also been completed. The editor has added to it an introduction in which the native characters and contents of the treatise have been described at length. The Bābu has likewise completed his edition of the Pratisakhya of the Black Yajur Veda. An English translation of the work by Professor Whitney having already appeared, it has not been deemed expedient to attach to this edition an Analysis in English.

The Śrauta Sūtra of Sātyāyana has likewise been completed, and its editor Paṇḍit Anandaśaṅkara Vedānta Vāgisa is now engaged on the last fasciulus of the Tāndya Brāhmaṇa of the Sama Veda, which, it is expected, will be completed in a short time.

The Society's edition of the Pingila Chāuddra Sūtra and of the Atharva Upanishad of which one and two fasciuli, respectively, have been published, are also in a forward state, and will be brought to a conclusion during the current year.

The same cannot, however, be said of the Sama Veda Saṁhita and of Chaturvarga Chintāmaṇi of Himadri. Of the former, altogether five fasciuli have been published, and this brings up the work to the middle of the 3rd chapter, or about one-fifth of the whole. The task is a difficult and troublesome one, and several years must elapse before it will be brought to a conclusion. Of the latter, the first out of its four parts will be completed during the current year.

It has been observed by some European scholars that the works undertaken by the Society are not rapidly brought to a conclusion, and the great delay which has taken place in the printing of some of the works, to a certain extent, justified the complaint. But the voluminous nature of those works and the little time which can be devoted to their printing by the several editors engaged, who have all onerous official duties to discharge, render it impossible to press on our publications faster. The necessity of undertaking several works at the same time also apparently swells the list of incomplete works. Mutations in Indian society, so much more rapid than in Europe, and death, have likewise had much to do in checking progress; but on the whole, the Council is satisfied that, bearing in mind the large number of works which are in the press, and the limited resources at command, the Bibliotheca is progressing as rapidly as could be expected.

PERSIAN SERIES.

Of the Persian series, Mr. H. Blochmann has issued two fasciuli of the text of the *Ā'in i Akbarī* (Fasc. XIV and XV). Fasc. XV completes the text of vol. I (600 quarto pages), and contains the first portion of an Index of about 4,500 geographical names of Upper India. About three fasciuli more will complete the text edition. He has also issued one fasciculus of the translation (Fasc. VI).

Maulawī Zulfakār 'Alī has issued three numbers of the *Farhang i Rashidī*. The first volume of this critical dictionary of the Persian language is now completed.

Maulawī 'Abdurrahīm, of the Calcutta Madrasah, has issued a full index of names of persons and geographical names occurring in the Society's edition of the *Pādishāhnāmah*. The index fills a double number, and renders, in the absence of a translation, the large work on Shāhjahān's reign more accessible. No work will in future be issued without carefully prepared indexes, and steps have been taken to prepare indexes to works issued in former years. The index to the *'Ālamgīrnāmah* by Maulawī 'Abdul Hai is about to be issued, three forms only being wanting. Maulawī Aghī Ahmad 'Alī has his index to the *Maāsir i 'Ālamgīrī* in press. Maulawī 'Abdurrahīm has commenced the index to *Khifī Khān*.

Two new works of importance have been commenced during last year, the text edition of the *Akbarnāmah*, and the English translation of the *Ṭabaqāt i Nāqirī*.

The *Akbarnāmah* by Abulfazl is the greatest historical work that India has produced. It consists of three volumes, the first of which treats of the Timurides, up to the death of Humáyūn; the second volume contains the most detailed account of Akbar's reign till 1011, A. H., when Abulfazl, at Jahāngīr's instigation, was murdered by Rājā Bir Singh Bundelā of U'rchah; and the third volume is the *Ā'in i Akbarī*. The edition

will also include the continuation of the Akbarnámah by 'Ináyatullah Muhibb 'Ali from the time of Abulfazl's death till the end of Akbar's reign (1014). Maulawí Ághá Ahmad 'Ali of the Calcutta Madrasah has been appointed to edit the work, which will be issued in the same size and type as Mr. Blochmann's *Áfn*. Two fasciculi have been printed. The edition is based upon nine MSS., belonging to the Society, the Fort William College, the Delhi MSS., and Maulawí Kabíruddín Ahmad.

The other new work is the translation by Major H. G. Raverty of the *Ṭabaqát i Náqirí*. This work is being printed in England by Major Raverty himself. Two fasciculi were printed during the last year, and a portion of them will within a short time be received for distribution in this country. Major Raverty has sent the following report on the progress of his works.

'I have much pleasure in stating, for the information of the Council of the Society, the progress I have made in translating the *Ṭabaqát i Náqirí*, and other matters connected therewith.

'When I first offered a translation to the Society, as stated in my letter on the subject, I intended merely to have made a fair copy of a translation I had made of the portions relating to India, in connection with my own particular studies in Muhammadan and Indian History, which I have been engaged in for the last eight or ten years—from the Society's printed edition of the text, edited by Lieut.-Col. W. N. Lees, LL. D. and his Maulawís, and a MS. in the India Office Library, which MS. and that belonging to the Royal Asiatic Society appear to have been the copies from which the printed text was taken, which printed text, in many places, is unintelligible, and does not correspond with those MSS.

'Having, subsequently, discovered a very old copy of the text, and seemingly far more reliable, although defective at the end, and like all MSS. more or less defective in a few other places, on comparing it with the other named above, I found such considerable and important differences to exist between them, that I determined—even without "*training a staff*" for the purpose—to go over the whole translation again.

'Our friend, Mr. Arthur Grote, to whom I am greatly indebted for assistance in many ways, also advised that I should avail myself of any other copies of the text that might be procurable.

'In the preface to the printed text, the editor remarks—"When I commenced the work, we had three copies [of the Persian text], one belonging to the Royal Asiatic Society, one in the India House Library, and one to the High Priest of the Pársís at Bombay. A little while afterwards, Colonel Hamilton, in reply to a circular of the Society, forwarded a copy from Dehli. These MSS. are all apparently good old copies, and are written in very different hands. It was supposed, then, that we had four distinct copies to collate; but before long, it became apparent that the four had

been copied from two MSS., so, in reality, we had only two * * * The Society had issued hundreds of circulars to all parts of India, and had failed to draw out more than two copies; and the fact that the four old copies I had, had been copied from two MSS. seemed to indicate so clearly the great scarcity of MSS. of this work, that I decided to go on."

'The editor's remarks are perfectly correct with regard to the India Office Library MS. and the Royal Asiatic Society MS.; for the mistakes contained in the former, are repeated in the latter exactly, even where two or three pages of the history of Mas'ûd of Ghaznî are inserted in the account of the Saljûqs.

'Mr. Morley also mentions the *Tabaqât* as "a work of rare occurrence;" but, however scarce in India, it is not so in Europe.

'On instituting inquiry, I found the Bodleian Library possessed one copy, and that there were two others in the British Museum. These were not to be procured on loan, and there was no other course for me to adopt than to proceed to Oxford and to London, to collate them, although I somewhat doubted whether it would be well to put the Society to the expense attending these journeys; but Mr. Grote strongly advised me to do so. I first collated the Bodleian MS., a tolerably good copy, from Section VII, where I commence my translation, to the end of the work, line for line, and word for word. This completed, I went to London and collated the British Museum copies—one, a very good one: the other, ordinary—in the same manner, and completed that task also. Altogether these labours occupied six weeks; and I regret to say that my sight has suffered in consequence.

'Having done this, I set to work; and six of the sheets were put in type, when our energetic friend, Mr. Grote, obtained the Hamilton MS., which copy of the text the Earl of Crawford and Balcarras was so very kind as to place at our disposal for six months; and, although it is not a very good copy, and defective at the end, it has been very useful. In the meantime, we had endeavoured to obtain the loan of two copies in the Paris Library, as it was impossible for me to go there to collate them; but after considerable delay, the favour was refused, on the plea that one was an *autograph* of the author's, and, therefore, could not be lent, and, that it would not be advisable to lend works of the kind to be taken out of Europe! I shall have something to say respecting this "autograph" hereafter, as I think I can put my hand upon three or four "autographs," equally authentic. I have had no difficulty, however, in obtaining collations, from those MSS., of passages which were at all doubtful, through the great kindness of M. Garcin de Tassy and M. Zotenberg. I find that they are, by no means, the most correct copies, and that even the "autograph" contains similar blunders to those of the India Office Library, and the Royal Asiatic Society's MSS., and likewise, the very great blunder of the author, which

occurs in every copy collated, which I have noticed at pages 160 and 165 of my translation.

'At this time also, I heard from His Excellency State Counsellor Von Dorn, that the Imperial Public Library of St. Petersburg contained a copy of the text, and the Imperial Academy of Sciences, two copies; and, that, without doubt, I could obtain them on loan. I applied to His Grace, the Secretary of State for India for aid, which was graciously granted; and, through Lord Augustus Loftus, British Ambassador at the Russian Court, the Imperial Russian Government, in its proverbially enlightened manner, at once, most graciously, complied with my request; and the three MSS. were, without delay, placed at my disposal, the first for three and the last for four months.

'The Imperial Public Library MS., from all appearances, is, probably, even more ancient than the copy I have referred to in the third para. of this communication, for it is written in the style Mullis generally write, although correctly written. The *dāls* are marked with a diacritical point, and other letters are written in a peculiar manner denoting considerable antiquity. If either copy has a claim to be considered an "autograph," this is the one best entitled to it; but I am sorry to say that it wants great part of Section XVII, and all the succeeding Sections. One of the Imperial Academy's copies is a modern one, comparatively, but still exceedingly useful; but the other, only a little defective in one or two places, and at the end of the last Section, is an exceedingly good one, and is also of considerable antiquity.

'Having been so fortunate as to obtain these MSS., I determined to make the most of them, and also of Lord Crawford's MS., and laying aside the translation for a time, I collated these four copies, word for word, with the printed text [a specimen, after collation, I have sent to Mr. Grote to look at]; and with constant application, I completed that laborious task, and returned the MSS. within a day of the prescribed time.

'I found such difference to exist between the two best Petersburg copies, and the others, that I deemed it my duty not to have the proofs struck off, until I had made the corrections and emendations, which, as shown by them, were absolutely necessary: hence the extra cost of corrections for the first six sheets of the translation, which the Honorary Secretary has noticed in his letter, No. 365 of November 8th, 1872. This extra cost, I regret; but, I hope I shall be considered justified in adopting the course mentioned.

'As to the printed text I must say, with regret, but conscientiously, that it is almost useless: there is scarcely a correct page in the book. But, when I consider that it was taken from two very incorrect copies of the original, it is not to be wondered at, and it was impossible it could be other-

wise. Even as it is, after collating so many copies, the editing and reprinting of a correct text would be, by no means, a light or an easy task.

‘It will be observed that I have commenced the translation from Section VII., and from that Section, it will embrace the whole work. The first six contain—I, an account of the Prophets, Patriarchs, etc., the ancestors of Muhammad, and his life; II., III., IV., the history of the Khalifas; and VI., the kings of Yaman. All these are of very little importance. The Vth Section is somewhat more important, and relates the history of the early Persian kings, but also contains so many errors, that a volume might be filled with notes to correct and explain it, and, therefore, I determined to omit it. I can give a brief resumé of the contents of those Sections to precede Section VII, on completing the translation.

‘My references to Elliot’s India are not directed, of course, to the whole of that work, but, merely to those portions of the *Ṭabaqāt i Nāqirī* contained in it, which appear to have been taken chiefly from the printed text, and consequently very considerable differences will be found to exist between that translation and mine, which I have endeavoured to make available for the general reader, and not for scholars alone.

‘I do not expect there will be many typographical errors—even of a minor nature—but of such as may be found to have crept in, I will, on completion of the work, give a list, with the Index and title page.

The long and unctuous adulations addressed to, and the constant prayers offered for, the “Sultān of the Sultāns of both Turk and ‘Ajam,” to whom the author dedicated his work, have been generally omitted or greatly reduced, and some of the introductions to Sections also, which are in a similar style, have been cut short, but in all other cases, I have not “compressed” the translation in the least degree, and I may say that I have weighed every word and sentence, and have omitted nothing, not even the poetical quotations. I may have to compress some of the longer poetical extracts, if of no particular merit or interest, but not otherwise.

‘I have noticed a very remarkable difference in the mode of expression in scores of places—the signification the same, but so very differently expressed—so much so, indeed, as to give one the idea that the Persian text must be a translation from another language. I have only space to mention this briefly now, but hope to do so in my prefatory remarks to the whole work, when complete.

‘Although the notes are numerous, and some somewhat long, I think it will be found that they were necessary to correct the author’s incorrect statements, and the serious blunders he often makes. I may truly say I have neither spared time nor labour, in endeavouring to make the translation acceptable to the Society and the public.

‘I cannot close this report without referring, briefly, to the kindness

and assistance I have hitherto received from various scholars ; and trust, when my labours shall have been brought to a close, to acknowledge them more particularly, and in suitable terms.'

The following are the names of the Sanskrit works issued during the last year—

The Sañhitā of Black Yajur Veda, with the Commentary of Mīdhava Achārya, edited by Paṇḍit Mahēsa Chandra Nyāyaratna, Nos. 229 and 230. Fasc. XXV and XXVI.

The Sāma Veda Sañhitā, with the Commentary of Sāyana Achārya, edited by Satyavrata Sāmasrami, Nos. 244 and 251, Fasc. IV and V.

The Chaturvarga Chintimāṇi by Hemidri, edited by Professor Bharata-chandra Siroamapi, Nos. 245, 257 and 262, Fasc. IV—VI.

The Gobhilya Grihya Sūtra with a Commentary by the Editor, edited by Paṇḍit Chandrakānta Tarkalāṅkār, No. 241, Fasc. III.

The Gopatha Brāhmaṇa of the Atharva Veda, edited by Bābu Rājendralāla Mitra, No. 252, Fasc. II.

The Atharvāna Upanishads with the Commentary of Nārāyaṇa, edited by Rāmamaya Tarkalāṅkār, Nos. 249 and 265, Fasc. I and II.

The Taittirya Prātisākhya with the Commentary entitled Tribhāshyaratna, edited by Bābu Rājendralāla Mitra, Nos. 253 and 259, Fasc. II and III.

The Tāṇḍga Mahābrāhmaṇa with the Commentary of Sāyana Achārya, edited by Paṇḍit Anandachandra Vedāntavāgīśa, Nos. 254 and 256, Fasc. XVII and XVIII.

The Chhandas Sūtra of Pingala Achārya with the Commentary of Halayudha, edited by Paṇḍit Viśvanātha Śāstri, No. 258, Fasc. II.

The Śrauta Sūtra of Lātyāna with the Commentary of Agni Svamī edited by Paṇḍit Anandachandra Vedāntavāgīśa, No. 260, Fasc. IX.

The Taittirya Aranyaka of the Black Yajur Veda with the Commentary of Sāyana Achārya, edited by Bābu Rājendralāla Mitra, No. 263, Fasc. XI.

The following are the Persian works issued during the last year—

The Ain i Akbarī by Abul Fazl i Mubārak i 'Allāmi, edited by H. Blochmann, M. A., Nos. 248 and 264, Fasc. XIV and XV (partly index).

The Farhang i Rashīdī by Mullā Abdur Rashīd of Taftah, edited and annotated by Maulawī Zulfaqār 'Alī, Nos. 250, 255 and 266, Fasc. VI—VIII.

The Index to the Pādishānamāh by Maulawī 'Abdur Rahīm, No. 261 (double number).

Translations.

The Ain i Akbarī of Abul Fazl i 'Allāmi, translated in English by H. Blochmann, M. A., No. 247, Fasc. VI.

The Tabaqat i Naqiri of *Sirajuddin Minhaj*, translated into English by Major H. G. Raverty (printed in England) Fasc. I and II.

Officers.

The duties of the Secretaries were performed by Dr. F. Stoliczka and Mr. Blochmann till June, when Captain J. Waterhouse was appointed General Secretary and has since that time edited the Proceedings, conjointly with Dr. Stoliczka and Mr. Blochmann, who have retained charge of the Natural History and Philological parts of the Journal respectively.

The office of Financial Secretary and Treasurer was held by Col. J. F. Tennant till the month of February when Col. Gastrell resumed charge of it.

The Council have again much pleasure in recording their satisfaction with the good services of the Assistant Secretary, Bábu Pratāpechandra Ghosha, B. A., they have also favourably reported on the work done by Bábu Manilál Baisak, Assistant Librarian, Sayyid Waliullah, store-keeper, and Babu Buddinath Baishak, Cashier.

LIST OF SOCIETIES AND OTHER INSTITUTIONS WITH WHICH EXCHANGES OF PUBLICATIONS HAVE BEEN MADE DURING 1872.

Batavia :—Société des Sciences des Inderlandes.

Berlin :—Royal Academy.

Birmingham :—Institution of Mechanical Engineers.

Bombay :—Royal Asiatic Society.

Boston :—Natural History Society.

Bordeaux :—Bordeaux Academy.

Buenos Ayres :—Public Museum.

Bruxelles :—Académie Royale des Sciences, &c., de Belgique.

Cherbourg :—Société Impériale des Sciences Naturelles.

Calcutta :—Agricultural and Horticultural Society of India.

——— :—Tattvavodhini Sabhá.

——— :—Geological Survey of India.

Christiania :—University.

Dacca :—Dacca News and Planters' Journal.

Dera :—Great Trigonometrical Survey.

Dublin :—Royal Irish Academy.

——— :—Natural History Society.

Edinburgh :—Royal Society.

Lahore :—Agricultural Society of the Panjab.

Leipzig :—Deutsche Morgenländische Gesellschaft.

Liège :—Société Royale des Sciences.

London :—Royal Society.

——— :—Royal Asiatic Society of Great Britain and Ireland.

- London :—Royal Institution.
 ——— :—London Institution of Civil Engineers.
 ——— :—Royal Geographical Society.
 ——— :—Museum of Practical Geology.
 ——— :—Zoological Society.
 ——— :—Statistical Society.
 ——— :—Geological Society.
 ——— :—Linnean Society.
 ——— :—Athenæum.
 ——— :—Anthropological Society.
 ——— :—Nature.
 ——— :—Royal Astronomical Society.
 Lyons :—Agricultural Society.
 Moscow :—Société des Naturalistes.
 Munich :—Royal Academy.
 Madras :—Government Central Museum.
 Manchester :—Literary and Philosophical Society.
 New York :—Commissioners of the Department of Agriculture.
 New Haven :—Connecticut Academy of Arts and Sciences.
 Netherlands :—Royal Society.
 Paris :—Ethnographical Society.
 ——— :—Geographical Society.
 ——— :—Asiatic Society.
 Stettin :—Entomological Society.
 St. Petersburg :—Imperial Academy of Sciences.
 Stockholm :—Royal Academy of Sciences.
 Vienna :—Imperial Academy of Sciences.
 ——— :—Anthropological Society.
 ——— :—Zoological and Botanical Society.
 ——— :—Imperial Geological Institute.
 Washington :—Smithsonian Institution.

On the motion of the President, the report was unanimously adopted.

The scrutineers then announced the elections of Officers and Members of the Council for 1873, as follows :

- | | |
|---|-------------------------------------|
| T. Oldham, Esq., LL. D., | <i>President.</i> |
| Babú Rājendralāla Mitra. | |
| The Hon'ble E. C. Bayley, C. S., C. S. I. | } <i>Vice-Presidents.</i> |
| The Hon'ble J. B. Phear. | |
| Dr. F. Stoliczka. | |
| H. Blochmann, Esq., M. A. | } <i>Secretaries and Treasurer.</i> |
| Captain J. Waterhouse. | |
| Col. J. E. Gastrell. | |

Bábú Rájendralála Mitra.
 The Hon'ble Sir R. Couch, Kt.
 T. Oldham, Esq., LL. D.
 Dr. F. Stoliczka.
 H. Blochmann, Esq., M. A.
 The Hon'ble J. B. Phear.
 Col. H. L. Thuillier, R. A., C. S. I.
 J. Wood-Mason, Esq.
 Captain J. Waterhouse.
 Col. H. Hyde, R. E.
 The Hon'ble E. C. Bayley, C. S., C. S. I.
 Rajah Jotendramohan Tagore.
 W. L. Heeley, Esq., C. S.
 L. Schwendler, Esq.
 Col. J. E. Gastrell.

Members of Council.

Colonel Thuillier said—"With reference to the Annual Report which we have just heard read, I think it will be apparent to the meeting, that the Society is greatly indebted to our worthy office-bearers, the Secretaries and Treasurer, who have so persistently devoted their time and talents to the interests of the Society. Whether we look at the remarkable punctuality with which the Journal of the Society is published, or consider the various ways in which the Secretaries maintain the reputation of the Society, and the Treasurer our financial interests, our warmest thanks are eminently due to these gentlemen.

"It is right to remind the meeting that the sole reason of Captain Waterhouse being appointed General Secretary was to relieve Messrs Blochmann and Stoliczka of some part of their various duties, at their own special request, in order that they might be better able and have more time to attend to their respective departments in the Philological and Natural History branches, which they still so admirably fill. By the valuable assistance of my excellent friend, Captain Waterhouse, I have no doubt the various duties of editing the Journal and other matters connected with the Society will be even better performed than heretofore.

I have therefore great pleasure in proposing a cordial vote of thanks to Messrs. Blochmann, Stoliczka, and Captain Waterhouse, the Secretaries, and Col. Gastrell, Treasurer."

The proposal was seconded by Dr. Waldie and carried unanimously.

The following gentlemen were elected to audit the accounts for 1872: Messrs. L. Schwendler and F. W. Peterson.

The President then read the following address.

PRESIDENT'S ADDRESS.

GENTLEMEN,—Another year has passed, and the recurrence of our anniversary reminds us of the propriety of taking stock of our progress, and ascertaining our exact position.

It will be needless to repeat the numbers so clearly given in your Council's report, or to detail the various changes in resident and non-resident members. It will be sufficient to refer to these details, and to state the broad result that the Society is not, pecuniarily, quite as well off as at the close of last year, that the amount of subscriptions realized has not come up to the estimate, and that the year has closed, leaving charges against the income of the Society for 1873, which properly should have been paid out of the income for 1872. We fear that this will continue to be the result of the working of the Society so long as we are huddled together into the corner of our noble house, without room even to store our books, and with all our property deteriorating rapidly, from the impossibility of properly attending to it.

The Society is fully aware from the addresses of previous Presidents, that we hold that we have a just claim for redress of these wrongs and injuries as against the Government of the country who, voluntarily and in the most solemn manner supported by all the formalities of a regular act of the legislature entered into a contract with the Society to provide ample accommodation for that Society on a certain date, the Society meanwhile allowing the collections, which they handed over to the care of the Government officers for the public benefit, to remain in the house they then occupied, and still occupy. This house and grounds are the undoubted property of the Society—they are in no way whatever subject to the control of Government in any one of its departments. And the Society has therefore from the date settled in the contract I have alluded to, been deprived of the rent which they could have at once realized for this house, from that date up to the present time, and they have further been mulcted, by the non-performance of their part of the contract by the Government of the country to the extent to which their property has been left so long without repair, and without renewal, which could not be satisfactorily done while crowded with collections, until now portions of it are unsafe, and in any case the serious cost of repair will absorb a very large sum. This just claim for the payment of a rent for the house they have occupied, for years after the stipulated time, had been as you are aware submitted to Government. The Society has not received a definite reply although more than two years have elapsed. The Council of the Society have endeavoured in every justifiable way to smooth the

path to a settlement, and more recently they have preferred to let the matter rest without further movement, because they felt so thoroughly convinced of the strict justice and unquestionable correctness of their claim, that they felt certain that time alone was requisite for a favourable solution of the difficulty. This claim is so strong that its strict legality has been maintained by several of the Judges of the High Court of Judicature, and to maintain it, in a legal way, it was only necessary to close our doors and to refuse the use of our house and so prevent the destruction caused by the hundreds which daily throng its halls. But, as I have said, the Council preferred endeavouring to obtain their just rights by quiet efforts to maintain the position of the Museum, while not in the least abandoning their claim. This *they never will abandon*; they seek no grant-in-aid of their efforts in promoting the spread of knowledge in the country, although this also they might fairly expect to receive; they ask no dole of charity to help out their existence, though the grant of such assistance would but honor the giver more than the recipient, for science has ever been the best handmaid of Government. But we maintain a just claim to the payment of certain sums, due to us under a solemn contract, and fairly and properly earned as it were by the Society, by the noble collections which they had brought together and maintained, even often at the risk of their own existence, and which they handed over for the public benefit. Surely the public is bound to acknowledge this value received!

Let us look at it in another light. What was the value of the collections handed over! It is almost impossible to put a money value on collections of this kind. The number of specimens gives no clue to it, their value depends much more materially on other considerations. Our collections contained all the typical and original specimens of Blyth's wonderful contributions to the Natural History of this country, those of Bryan Hodgson in numerous departments, many of Jerdon's specimens, many of Buchanan Hamilton's; large series contributed from other countries identified by the original describers and contributors. It contained a noble series of Sewalik fossils all of which had been carefully examined by Dr. Falconer himself, and carefully catalogued. And it also contained a very extended collection of objects representing the fauna of this country from various sources. Such a collection could not have been obtained anywhere else for *any* money. And I have no hesitation in saying that had it been put into the market and offered for sale, it would have readily realized a sum of two and a half lakhs of rupees. Take even less than this sum at five per cent., and the Society would have had an income of 10,000 Rs. per annum, or more than 800 Rs. per month! And this I would add, with their house unincumbered and free for the prosecution of their own immediate objects. Gentlemen, it may suit the views of some who seek possibly the aggrandizement of their own position, or to

enlarge upon their own contributions to such collections, to depreciate the value of the Asiatic Society's collections. But I speak with a full knowledge of the feeling of true naturalists, and true palæontologists, when I say that such a storehouse of the accumulated facts of generations, such an accumulation of original species, of the absolute labours of the great workers in the Natural Sciences, was simply invaluable.

Gentlemen, I have dwelt upon this subject, although for many reasons I would have greatly preferred to pass it over in silence, because I have been made aware that a most erroneous, and strangely erroneous, idea prevails in certain places, that the Government of the country contributes largely towards the Asiatic Society's support. It is needless to tell you, as the members of the Society, that this is not so; that we do not in fact receive one single pice of the public money as income of the Society, and have not for many years past. We acknowledge with thankfulness the liberality with which on some occasions, when special wants were represented, the Government have aided the Society, but none of these have occurred for years past. We acknowledge that for years when unwilling to adopt other and better means of exhibiting to the people of this country the resources of the land in which they dwelt, the Government maintained, at a rate of remuneration on which a decent clerk in an office would be supposed to starve, a Curator to take charge of collections to which the Society gave, free of all charges, room for exhibition and study, and also contributed the same small stipend to the support of a man of wide European reputation, and who had devoted a lifetime to the Natural History of the country. But contributions to the Society, for the objects of the Society proper, there have been none.

A sum of 6,000 Rs. per annum is now passed through the hands of the Society as Trustees for the publication and issue of the *Bibliotheca Indica*, a noble and invaluable series of the standard vernacular literature of the country; and one which well repays the limited outlay of 600£ a year. But the grant of this sum gives not one pice to the Society. It gives a very large amount of trouble, anxiety and responsibility, which are voluntarily borne by the Philological Committee and Council of the Society, rewarded only by the consciousness that they are doing good. But as I have said, not one fraction of this grant goes to the Society. The accounts are kept most strictly separate, as any one can satisfy himself by a mere reference to the accounts of the Society.

I refer also to this for another reason because I find in some Statistical returns of Educational and Scientific institutions recently issued by the Government of Bengal, the Asiatic Society is set down as possessed of an 'endowment' of 190 Rs. per year. Now the facts of this were fully explained to the compiler of the tables, and I cannot understand how with

these facts before him, this statement should have been allowed to go to the public. This so-called endowment, gentlemen, is the interest on a few thousand rupees which the Society itself has invested in the funds of the country, the result chiefly of accumulated entrance fees of its members. It is just as clearly a part of the ordinary income of the Society as is the subscription which I, as an ordinary member, am called upon to pay annually, and can be dealt with by the Council in exactly the same way. It would indeed be well for the Society if it had an endowment even of small limits. And we shall feel indebted to the author of the tables or any one else, if he will establish such an endowment. But when such does not exist, the statement of it is likely to lead to serious misapprehension of the position of the Society.

We rest, therefore, in the perfect confidence that the just and undoubted claim of the Society for remuneration for the heavy damages inflicted on the Society by the continued occupation of their premises and the consequent depreciation of their property,—in addition to the injury done by keeping the Society in a position in which it can hope for few additions to its numbers, and can offer but little advantages to its working members,—that this claim will be acknowledged without further demand, and that the Society will be freed from the heavy incubus under which it now rests.*

During the year, the Society has lost by death eight ordinary, one honorary and one corresponding member. Among these were some distinguished in the ranks of science, and long supporters of our Society.

The year had scarcely opened, when we were, in common with every well-wisher of the country, stunned by the fearfully sudden and awful death of the Viceroy, our Patron. It was not within the scope of the Asiatic Society's objects to discuss the many political questions which had more immediately engaged Lord Mayo's attention, but we could not fail to appreciate the earnest and thorough heartiness of Earl Mayo's character, or to feel profound regret at his being cut off in the very height of a successful career by the hands of an assassin.

Lord Northbrook, his successor, has been pleased to accept the office of Patron of the Society, left vacant by Lord Mayo's death.

* It is with the sincerest pleasure, that I am able to stop the printing off of these pages, and announce that the Government of India have, after careful consideration, acceded in full to the claims of the Society. This is peculiarly gratifying, to the Council of the Society, who have found themselves in the painful position of apparent opposition to the Government of the country, while, after the calmest and most unprejudiced consideration they could give to the subject, they found their convictions of the justice of their claims so strong that they were unable to retreat one single step. They feel, therefore, most thankful that any further difference of opinion has been thus removed.

In Dr. Jerdon, the Society has lost an old and well-tried friend and fellow-labourer. It is now more than thirty years since his 'Catalogue of the birds of the Peninsula' was published in the Madras Journal for 1839. And the numerous papers which he has since published in that Journal and in the Journal of our own Society shew that his interest in this subject had never ceased. His 'Illustrations of Indian Ornithology' was among the earliest attempts at proper coloured figures of Indian Birds. His labours may be said to have culminated in his well known and oft quoted 'Manual of the Birds of India,' followed by his 'Game Birds of India.' Even after he had retired from active service, and left the country, his first desire was to publish a supplement to this valuable work, which he largely succeeded in doing by a series of papers in the 'Ibis.' Indeed it is a proof of how entirely his heart was wrapped up in the subject, that he was talking with his friend, Drescher, of the 'Birds of India' until within a few hours of his decease, not conscious of the danger that was impending over him.

Nor did he, while thus devoting his attention chiefly to birds, neglect the other classes of Vertebrata. He had conceived the noble idea of furnishing students of Indian Natural History with monographs of each of these classes, which he accomplished so far as the Mammalia were concerned. Reptiles also had engaged his earnest attention for years, and were the subject of an active and extensive correspondence with Gray, with Cantor, and Blyth. Our Journal contains a catalogue of the Reptiles of the Peninsula of India, which shews how desirous he was to attain accuracy in his determinations, and since the publication of the Mammalia and Birds he had been most assiduously collecting Reptiles, and indeed the first portion of his monograph on the Reptiles of India was actually printed. I should notice also his very valuable catalogue of Fishes, in the Madras Journal, while in a different branch of Natural History entirely, his descriptive account of the Indian Ants is one of the best yet published. He had contributed to Benson and Blanford many shells described by those writers, while many entomologists in India can point with satisfaction to valued specimens of beetles and butterflies for which they had been indebted to Jerdon's liberality. To all this range of natural knowledge he added a wide acquaintance with Botany and the plants of India, especially the ferns.

Most of this work had been accomplished while Jerdon was in active service with his regiment, and dependent on his own resources for books, specimens, &c. for comparison. Gifted with remarkable powers of conversation, and with his memory richly stored with anecdotes of others, and observations of his own, he was a charming companion, while his untiring energy, and keen sense of personal enjoyment, were absolutely infectious.

Jerdon has left behind him an immense store of valuable notes, and of coloured sketches from life, which we hope and trust may still be utilized.

With less originality perhaps than either Blyth or Bryan Hodgson, he has yet done more than any other individual for the *Natural History of India*, by his valuable *Manuals*. And it is much to be wished that the series may be completed and brought up to date by some of his successors. Dr. Jerdon was an officer of the Madras army, and although in the course of his military service he had visited parts of Central India, it was not till late in his career that he had an opportunity of visiting and enjoying the glorious scenery of the Himalaya, which he did with a peculiar freshness and keenness of delight.

Sir Donald McLeod was one of the oldest members of the Society. He joined our ranks in 1837, more than the third of a century since, and since that, has been an undeviating friend and supporter of the Society, taking the liveliest interest in every step that marked its progress, or that tended to improve our knowledge of the peoples of this country and their history. He was not an active contributor to our *Journal*, but was always an earnest supporter of science, and an able and disinterested adviser on all points. Of unbounded hospitality, which was exercised with a simplicity of courteousness and thoughtful kindness, which led all to look to him as a friend, of the widest and purest sympathies, Sir Donald McLeod possessed the singular power of attaching to himself all with whom he came in contact; a power, which gave him a command over his fellow men, due rather to the influence of his individual character than to the grasp or power of his intellect. He was in fact a singularly loveable man, and will ever be remembered by those among whom he lived so long, and over whom he had exercised a benevolent sway for years, as a friend and benefactor. The Society will feel his loss as an earnest and enlightened promoter of sound education.

During the year we have also lost in Mr. C. Horne, C. S., a valued contributor of several *Archæological papers* to our *Journal*. He came to India at the age of 20 in 1843, and finally returned to England in 1869. He had been a member of this Society since 1863 up to the time of his death last year.

Colonel Sykes, whose connection with India dated almost from the very commencement of the century, had ever been an earnest cultivator of the *Natural Sciences*, and as Director of the East India Company a steady and warm supporter of every effort to promote the welfare of this empire. He had contributed to various journals many very excellent papers on the *Geology*, *Ornithology* and *Meteorology* of India.

From among our corresponding members, one name of high note has been removed by death. Theodore Goldstücker, who died in March 1872, at the early age of 51, was a native of Königsberg. He commenced the study of the Sanskrit under Professor von Böhlen, at an early age. He also studied the Hegelian philosophy under Rosenkranz. At Bonn, he continued his

studies under Schlegel and Lassen. His first publication was the *Prabodha Chandrodaya*, which appeared in 1842. He proceeded to Paris from Bonn and then became a pupil of Eugène Burnouf, and later he paid a short visit to England. In 1859 he was invited by Professor Wilson to come again to England and assist in the preparation of a new edition of his Sanskrit dictionary. He undertook the revision, but under his hands it became so vast an undertaking that only six fasciculi, containing the greater portion of the first letter, were published. A few years after his arrival in England, he was appointed Professor of Sanskrit at University College, London. In 1861, he published his essay on Pāṇini, as introductory to a facsimile edition of the *Mānava Kalpa Sūtra*. He also carried through the press for the Indian Government a photo-lithographic facsimile of the *Mahābhāṣya* which is nearly complete.

Dr. Goldstücker was elected a corresponding member of this Society in 1863.

A general review of the work done by the Society during the year will I think show that there has been no diminution of zeal, no want of earnest and thoughtful work.

The issue of the *BIBLIOTHECA INDICA*, which the Society have voluntarily undertaken to edit on behalf of the Government which supplies the necessary funds, has, on the whole, progressed very satisfactorily. I feel bound to allude to this subject rather more pointedly than otherwise I should feel justified in doing, because during the year some critical remarks have issued from the pen of one at least of the ablest orientalists of Europe. Prof. Weber in a review of the labours of the Society in connection with the *Bibliotheca Indica*, as extending from 1865 to 1870, acknowledges in a hearty manner the judicious selection of works for publication, and fully admits that the several editors, principally native scholars, have truly performed all that could have been at all expected from them. In truth, Professor Weber speaks only in terms of praise and approval, of the works selected and the mode in which they have been edited. But his objections are based, I may say almost solely, on the delays which have occurred in the issue of successive parts or fasciculi of various works which extend over many pages. Now, no one can be more thoroughly alive to the force of this objection than the Philological Committee of the Society, under whose special charge these publications are. But I fear Professor Weber's experience of the conditions of literary work of this kind in Europe, and in the midst of the learned centres of literary activity, where he resides, scarcely enables him to realize the almost unspeakable difficulties which accompany the effort here. There is not among the long list of editors of our *Bibliotheca*, one single person who has not heavy and continuous official duties to perform which occupy by far the larger portion of his time, and which give none of that literary ease, so essential to

the satisfactory pursuit of such studies. Heavy critical work requiring constant thought, and much accuracy of comparison can in this country only be taken up, after the mind and after the body too are fatigued and jaded. And the wonder really is, that so much can be done as has been, not that more has not been accomplished. And further, the conditions of society here which lead to much more rapid changes than elsewhere, tend to retard, if not altogether to interfere with or interrupt, the progress of such editions. In many cases, the editors who have commenced the publication of works in this valuable series, have been carried off by illness, and new editors had to be sought out. In some cases owing to these causes, successive portions of the same work have been entrusted to the care of three and four different scholars. Every such change inevitably involves delay. Time is required to seek out a new editor; he must fully acquaint himself with what has been done and what he is to continue and so months, and even years, pass over before the work can be satisfactorily resumed. I know of one case in our experience in which with all possible anxiety to publish as quickly as possible one of the most valuable remains in Hindi, the negotiation for editing the work has extended over years and nothing definite is, I believe, yet adopted.

But further, owing to the necessary delay in the transmission of these fasciculi to places in Europe, Dr. Weber, in common with others, complains of the irregularity with which the fasciculi are received. This is a grievance under which we suffer in this country quite as much as European scholars can possibly do. The delays in the transmission of books are most vexatious and destructive to progress. But unquestionably these are not chargeable to the Society, for every care is taken to despatch as quickly as practicable the successive fasciculi.

Of the several works noticed as still incomplete the past twelve months have seen the conclusion of some. The *Taittiriya Aranyaka*, on which Babu Rājendralāla Mitra has been engaged for the last seven or eight years has been completed, forming a volume in all of considerably more than 1000 pages! It is accompanied by a complete analysis of the work in English, and a valuable table of contents. The *Gopatha Brāhmana* has also been completed by the same editor after it had been in the hands of another scholar, whose death interrupted his labours. In this also, an introduction is given describing at length the nature, character, and contents of the work. Another work of high value completed during the year has been the *Pratis'ākhya* of the Black Yajur Veda. For this, the preparation of an analysis in English was considered unnecessary, as Professor Whitney had already published a translation.

The *S'rauta Sūtra* of Lāthyāna has likewise been completed, and the learned Pundit who has edited it, gives promise of the *Tāndya Brāhmana* of the Sāma Veda, which he has undertaken. It is hoped, with some confidence,

that the Atharvana Upanishad, and the Piugala Chhanda Sūtra, will both be completed in the current year.

The fourth volume of the Sanhitā of the Black Yajur Veda, has also been completed, and the fifth is in hand. Of the eight books constituting the work, the three which now remain are short, and another volume will probably suffice to complete the whole. We are more disposed to feel gratified at having been able to advance this important work, so far as it has proceeded, under the difficulties attendant on its publication, than to be dissatisfied with the time occupied. The first book was edited by the late Dr. Roer, the second by Professor Cowell who then left this country, and the greater portion of the third by Pandit Ramanāryana Vidyāratna, and, on his death, it was taken up by the present editor, Professor Mahesachandra Nāyāratna.

It will not be necessary to vindicate the Society from charges of delay and neglect with regard to its Arabic and Persian issues which are acknowledged to be progressing with favourable speed, and to contain the most valuable historical works known to exist. And the principle on which the Society has acted of confining their publications to works bearing on India meets full approbation.

In connection with these subjects, I would myself as one not having the slightest pretension to such a knowledge of oriental languages as would justify my offering an opinion on the style in which these various works have been issued, express the gratification which I feel at finding scholars like Professor Weber, admitting fully the value of the series, and acknowledging the ability with which they have been conducted. But I would go further and venture to urge on those learned scholars who are so actively engaged in these pursuits, and who have been for years earnestly and actively endeavouring to make known to the world the rich stores of literary wealth which this country offers for utilization, whether the publication of translations into English accompanied by notes illustrating from other sources the text of their authors, would not gain for them a far wider and more numerous audience, and would not tend to advance very importantly the knowledge of their authors by bringing to their illustration the varied acquirements of others.

As an instance of how much knowledge can be brought to bear upon a single text, of what a flood of light can be thrown upon a single phrase even, I would ask any one to study Yule's marvellous edition of Marco Polo, which though not issued within the year under review may serve as an instance of what one would desire to see done, in a very minor degree, towards the illustration of some of the great national works the text of which is given in the Bibliotheca Indica. I am not sanguine enough to hope that many, if indeed any, may be found who could bring to their subject such a varied range of reading, so large and almost unlimited a stock of acquired, and still more

wonderfully systematized, facts, such quaint and curious illustration derived from the most unexpected sources, and yet most aptly and charmingly brought to use. Nor can it be, that many will be found capable of conveying all this information with such a charming simplicity of language or with such a force and power of description, that fragmentary as the whole is, one is unable to lay down the book when once commenced. But much would undoubtedly be gained, while more information than can be obtained elsewhere would be made accessible to all.

In connection with this subject, I am myself aware that for many years our able Secretary Mr Blochmann has been bringing together from every source opened up to him in the course of his extended study, a complete index to all geographical names mentioned in these oriental works. This 'Index Geographicus,' will be—if it ever see the light as we hope, and trust it will,—a glorious mine of knowledge charged with ore of the richest quality, and of the brightest and purest kind, and will really throw more light upon the changes, historical and political, dynastic and geographical, which have passed over this land, than any single collection that I can think of. Col. Yule has I rejoice to say undertaken to prepare for publication, and has far advanced in the work, a Manual of the Geography of India, which I have no doubt will contribute very largely to our acquaintance with the subject. He has indeed during the past year, given us a foretaste of the pleasure we are certain to derive from his labours, by a most masterly essay, introductory to the new edition of the travels of Captain Wood to the source of the Oxus. I would gladly dwell on this subject for a little. The district calls up every fanciful picture of Eden which may have joyed our childhood, and here we find all primeval tradition combining with all modern theory and knowledge, pointing out the cradle of our race, and the site of the Adamic Paradise, while its past history is interwoven with that of all the great Asiatic conquerors, and its coming history 'looms on the horizon rife with all the possibilities suggested by its position on the rapidly narrowing border-land between two great empires, one of them our own.'

But the wide range of the subject, and the value of Col. Yule's exhaustive interpretation of all available evidence bearing on it, would take up far more time than can now be spared. I would, however, commend this essay 'On the geography and history of the regions in the upper waters of the Oxus,' to every one who takes an interest in the early history of the country and of the many changes which have passed over it.

In connection with these publications of the Society and others, we may perhaps take a glance at some other publications bearing on the Archaeology of India. The Journal of the Society for the past year will be found rich in such information. We have descriptions of the antiquities of Baranpūr, Bindrabun, Gokul, Benares, Jaunpūr, Bengal and parts of Orissa. And

before all others, the masterly account of Bihar by Mr. Broadley, containing a mass of accurate description and information, the result of most zealously conducted researches and excavations. During the year also we have had the reports of General Cunningham, the Archæological Surveyor, detailing his researches during the seasons of 1862 to 1865 and affording a rich treasure of historical and other information regarding the districts visited, Behar, Gya, Tirhoot, &c., with a full discussion of the accounts of Fa Hian and Hwen Thsang. The second year was devoted to Delhi, Mathura, Kanauj, Allahabad, Ajudhya, &c. The third year's report takes up the Punjab and its ethnology and antiquities, while the fourth discusses the history of Jaipur, Ajmere, Gwalior, &c. A portion of these reports originally appeared in the *Journal* of this Society, but without the many and valuable illustrative plans and drawings which now accompany them. The work, in two goodly-sized volumes of more than 500 pages each, forms a convincing proof of the justice and wisdom of Lord Canning in first appointing General Cunningham to this task, and shews too what an almost exhaustless supply of valuable information bearing on the history, the architecture, the dynastic divisions and the geographical features of the country yet remains to be worked out. There is no question that many of the views put forth will be subject to modification and change as knowledge increases or more extended research is made. But this is the case in every such enquiry and in no way detracts from the value of these interesting reports.

Another work published, or at least received in India, during the year treats of another and very interesting part of the archæology of the country. The rites of sepulture, the curiously varied and complicated ceremonies observed by some people, and the simpler ritual which marks the proceedings of others give a special interest to all remains of the ruder monuments which in many countries mark the localities where the great dead have been interred, or their ashes entombed. Mr. Ferguson, to whom Indian archæology is so largely indebted, has given us a very full and satisfactory account of these rude stone monuments in all countries and among others in India. The portion of his work bearing on India, is by no means so full or satisfactory as other parts. But seriously deficient as it is, it gives an approximation to the state of knowledge on the subject, which will be of vast use. Indeed the real value of all such general treatises consists in this, that they indicate the boundary between the known and the unknown, and enable students to start from the advanced posts of existing knowledge without wasting time in preliminary investigation, or going over ground which had been fairly examined before; and in this point of view, such works as Ferguson's are of high value. But the very facility which they give ought to lead to early refutation or confirmation of their statements. Such sweeping assertions as that these rude stone monuments do not exist in the valley of the Ganges or any of its tribu-

taries, could be so readily disproved, (and indeed it has been) that there is no excuse for allowing it to remain before the world as a statement of facts. But I would hope for much more than this, and ask every one who has an opportunity of seeing such monuments to figure them and give a careful description of them, so that not only their mere existence, but all their peculiarities may be known.

Another work on Indian Ethnology and the habits and customs of the races inhabiting Bengal as the province is known now, which appeared during the year, is the splendid volume of Dalton's descriptive Ethnology. This was brought out at the cost of the Bengal Government, under the immediate supervision of the Council of this Society, and it is certainly one of the most admirably illustrated, as well as printed, books yet issued from Calcutta presses. But it has higher claims on attention than the mere get-up of the book. Col. Dalton has here given not only the information which he was able to obtain from others, but has told us in plain nervous language, and with a keen appreciation of humour throughout, his own experience with the wild tribes and peoples among whom his long service in India has almost exclusively been passed, and who have learned to know him so well, and knowing him to trust him so implicitly, that they who would flee in terror from other white faces come to him as an intimate friend and play with him as a loving child would with a revered parent. Indeed one of the great charms of the book is the insight you get into the true basis of those relationships of intercourse and friendship which have existed for years between the writer and 'his children.'

Descriptions ranging over such a wide circle of races could not be anticipated to be equally detailed or equally accurate in all. But if blemishes occur I hesitate not to say that those who read Col. Dalton's descriptions will rise from their perusal with enlarged information, and with matured sympathies. I would even suggest to the author whether he would not think of publishing a smaller and cheaper edition, taking advantage of any additional information which may have cropped up since, and using fewer illustrations thus rendering the work accessible to a much larger circle of readers. I must add that great credit is due to the Government of Bengal for the liberality with which it has enabled so nobly illustrated a volume in the ethnology of its provinces to be published.

In addition to the truly valuable series of descriptive papers on the antiquities and history of various places in India, we have in the Journal for the past year some curious coins illustrated, and notably a fine series of inscriptions of various dates, from some nearly five centuries old, down to last century and many throwing rich light on historical facts. It is hoped that this valuable series of the inscriptions may be continued, for General Cunningham has placed in our Secretary's hand, for decipherment and publication,

all his unequalled collection of these records. It may be noticed as a curious illustration of the value of such, even when apparently so placed that they must be tolerably known, that an inscription, which records a king in Bengal hitherto entirely unknown, was brought from the well known town of Kalnah on the Hooghly, where it must have been seen by thousands of visitors, none of whom ever thought of deciphering or taking a rubbing of the inscription! A rich store of facts, both historical and chronological, will doubtless be opened up by the careful examination of such inscriptions, and in no one's hands could the task have been placed with higher prospects of success than in those of Mr. Blochmann.

Under the garb of a small School Manual published by the School Book Society, Mr. Blochmann has also given to the public one of the best and most complete Manuals of the Geography and geographical statistics of India, which has yet appeared. The information is derived from the most recent sources, and is not a mere reprint or compilation of the obsolete statements of Thornton and others, and in the smallspace of a little pocket volume, it contains an immense amount of condensed information bearing on the area, position, population, antiquities, history and general relations of all the divisions of the country.

If we turn our attention now to the division of our sciences represented by the second part of the Journal, I am justly able to congratulate the Society on a most fruitful and successful year. Dr. Day has continued his admirable Catalogue of the Indian Cyprinidae, of which this year has given us three fasciculi. He has also described the fish collected in Kach'h by Dr. Stoliczka and discussed the relation of some of the genera of the Siluroid group.

The Mollusca of India have been illustrated by an excellent monograph of the Indian Clausiliæ by Mr. W. Blanford and Dr. Stoliczka. The land shells of Penang, and of Burma and Arrakan, have been well illustrated and described.

Dr. Dobson has continued his able and careful researches on the Bats of India and adjoining countries, describing several new and most important forms. I greatly wish we could hope to see from Dr. Dobson's accurate pen, a well illustrated monograph of Indian Bats. He must have already brought together nearly all the facts requisite for such a detailed catalogue, and the needful illustrations could readily be obtained in this country. I have no doubt that such a work would at once meet with all the support requisite to secure its success. There is a vast amount of information bearing on the Natural History of India already published, but published in such a scattered way, single papers here and there, in different journals and in different languages, that ordinary students, under the conditions of Indian life, have

no possible means of knowing what has been done, or what is already well known. Hence the supreme value of such monographs, compiled by those who have made a special study of the different groups and brought their knowledge up to date. No question such monographs would very rapidly require additions and call for alterations. Indeed this is the very result which would be sought by their publication, the bringing in new facts and exciting wider attention to the investigation. But this would not detract from their value, as statements of knowledge acquired up to a certain date, and as affording a safe and carefully determined point of departure, from which future enquirers might start on their voyage of discovery.

The contributions of our able Secretary, Dr. Stoliczka, are valuable as usual. Besides his molluscan papers to which I have just alluded, we have a remarkably interesting and valuable paper on the Mammals and Birds inhabiting Kutch,—an admirable type of what the study of local faunæ is capable of yielding. He has also given some valuable notes on new or little known Lizards, and on Indian Batrachia; these papers on Kutch reptiles and Sind reptiles are sufficiently illustrated, and together constitute a range of additions to our knowledge of the Natural History of the country of the highest value and greatest scientific importance.

Ornithology has added to its store in the papers by Mr. Brookes on the Birds of Cashmir, and his brief notes on the Eagles, and Swans, &c. Mr. Hume has given a short critical notice of some Burmese birds; Major Godwin-Austen a third list of birds found in the Kasia and Garo hills, while Mr. W. Blanford has described and beautifully illustrated the birds of Sikkim. He has also given in the Journal the last part of a very interesting and charming account of his trip to the borders of Thibet in the Sikkim country, devoted entirely to the geological portion of his enquiries.

But while this summary will give sufficient evidence that the study of Natural History has lost none of its absorbing interest, and that the Asiatic Society of Bengal has fully and nobly maintained its grand traditional position as the repository of most of the advances made in these enquiries in this country, we can also congratulate you, gentlemen, that activity has been shown in other directions also, and outside our ranks. There is at last a fair prospect of the 'Flora Indica,' commenced many years since by Drs. Hooker and Thomson, being carried out under Dr. Hooker's guidance, and we are delighted to welcome it as a great, and at the same time necessary, contribution to our means of progress. The 'Flora Sylvatica' of Beddome also progresses soundly: the 'Conchologica Indica' of Hanley and Theobald, a work which, with all its very serious shortcomings, will be of great utility and value—still finds support and appears with regularity, while during the year we have had to welcome a new candidate for this support in an Indian magazine devoted to Ornithology. We could have wished that the author had completed the

several works which he had already commenced, rather than started a new publication. But we heartily welcome at the same time the issue of 'Stray Feathers.' It promises to be a useful catalogue of the Editor's very noble collection of Indian Birds, and a means of rapid publication of novelties or corrections, always of much value with ornithologists.

During the year also a very admirably illustrated work on the deadly Snakes of India has been issued at the cost of Government. The beautiful plates which are given with Dr. Fayer's treatise on the Thanatophidia must always command attention and recommend the work, while unfortunately they also add so very seriously to the cost of the book as entirely to preclude the chance of its ever getting into the hands of any but the wealthy. The work too does not pretend to be more than a practical statement of facts concerning these dangerous enemies to human existence in the country. It has no scientific novelties or discoveries to render it important as a work of reference in libraries, while as we have said it is locked up from the general public to whom it might be useful by the extreme cost. Could not all the information be given in a far more accessible form and at a very trifling cost?

Other matters of high interest have been brought before the public, though not immediately through the Society. One of the most important and probably fruitful discoveries of modern years in Physiology has appeared in the modest form of an appendix to the eighth report of the Sanitary Commissioner with the Government of India. This is the discovery by Dr. Lewis of a *Hæmatozoon*, inhabiting the human blood, and certainly accompanying, and in all probability causing, peculiar conditions of the secretions, frequently rapidly fatal and always exceedingly injurious to health. This is scarcely the place to discuss the details of such a discovery which, bringing into notice a diseased condition hitherto totally unknown, and in all probability opening the road to further discoveries regarding obscure diseases, especially affecting countries situated as we here are within the tropics, opens up an entirely new but most important enquiry.

The careful researches of Dr. Lewis associated with his able colleague Dr. Cunningham into the history and concomitant conditions of choleraic affections, must be well known to most of our members. And I have no hesitation in saying that the last contribution of these gentlemen published in the same report I have alluded to, adds largely to the mass of *facts*, bearing on this, to India, all important subject. The accuracy with which every appearance is sifted, and the evidence investigated, before it be admitted as a fact, and the fulness of the information sought and obtained, will render the entire series of these admirably conceived and executed microscopical enquiries, altogether essential to the study of this malignant

disease, the cause of which is still so obscure and unknown. And I would add also, will form a very excellent contrast to the carelessly arranged and hastily admitted, or even distorted, evidence, which has more than once been adduced in support of some favourite hypothesis as to the mode of propagation of this disease.

Dr. Lewis has also given the results of a careful investigation of the condition of cysted meat, such as is frequently to be met within the bazar. And perhaps it may comfort many, who may have been alarmed by ideas of disease to be communicated by eating such food, to know that he has conclusively shewn that such living organisms are entirely killed, if the meat containing them, be subjected for even five minutes to a temperature of no less than 145° Faht. Rarely indeed are human beings found so cannibal in their tastes, that their cooked food has not been subjected to this condition of temperature, and therefore rarely indeed can there be any fears of such diseased condition of the tissues being conveyed into our system. It is also a gratifying result of Dr. Lewis's enquiry, to notice the very rare occurrence of diseased meat of this kind, among the rations provided for our troops in this country.

Though special in their application I cannot avoid bringing to your notice the extremely valuable series of volumes, prepared by my friend and colleague in the Geological Survey, Dr. Stoliczka, descriptive of the cretaceous fossils of South India. These volumes form an invaluable record descriptive of one of the finest and most extensive collections from a single formation and a single district, which has ever been brought together, and have been prepared with a fulness of illustration and a widely embracing accuracy of description which render them essential to the Palæontologist, and almost equally essential to the recent Conchologist. We desire to acknowledge the liberality with which the Government of the country has provided the funds necessary to enable us to double the quantity issued in the year of this series descriptive of Indian Fossils, and we rejoice the more in this, because we read it as a convincing testimony that the loving labours of my colleague, Stoliczka, are really appreciated. I who can speak from experience of his unfailing energy, of his untiring research and marked accuracy, and of his wide range of knowledge of all the bearings of his subject, know full well the immense labour which these works represent, the high scientific value of that labour, and the great interest which they have excited among the Palæontologists of Europe. But more than all this I know too, and appreciate fully, the unswerving loyalty to his task, which the author has invariably shewn, and the undeviating conscientiousness and devotion which he has brought to bear on its accomplishment. Not only do we feel the high claims that Dr. Stoliczka has to rank among the very first of living molluscan Palæontologists, but personally I would testify also to the claims

which he has established to be viewed as one of our very best friends and advisers, as well our ablest colleague. We have been making great efforts to complete the entire series of these cretaceous fossils which will form four very large volumes, convinced that they will be the very best proof of the ability of the author that can be submitted to the world of science at Vienna, as well as the noblest monument of his zeal and power.

As speaking of the labour of the Geological survey I may here notice that we have been rewarded during the past year by one of the most important discoveries which stratigraphical palæontology has made for several years. Dr. Waagen, whom ill-health has, I am sorry to say, driven to Europe again, has found true Ammonites in beds which from their other fossil contents will be unhesitatingly admitted as palæozoic. There may be some slight question as to the exact horizon in the carboniferous series which these beds hold, or whether they may not to some extent represent the border land between the carboniferous and permian, but *Athyris Roissyri*, *A. subtilita*, *Producta costata*, &c. are species which will be at once admitted as carboniferous and these are the associates of the Ammonites. I had taken advantage of Dr. Waagen's wide knowledge of fossils and of their distribution in establishing a careful research into the stratigraphical relationships of the curiously distorted, and faulted rocks of the Salt-Range in the Panjab, from which some very interesting fossils had already been described by Koninck, Davidson, &c. and it was while so engaged that he was rewarded by this most important discovery. It would be passing into discussions rather too technical perhaps to enter here upon any consideration of how far this discovery is consistent with views based on the developmental theories now generally admitted in the explanation of the several homologies in such series as those acknowledged in the Cephalopoda. It will suffice to state that the fact of the occurrence of a true Ammonite in unquestionably palæozoic rocks is one calculated to excite as much surprise as did the announcement many years since of the beautiful Ammonites (with Orthoceratites) found in the Triassic beds of Europe. The curious fossil, with some other of its associates, has been figured in the Memoirs of the Geological Survey of India.

Viewed therefore as a whole, the year 1872 has not been unfruitful in natural history progress and a fair general activity in such pursuits has marked our Indian labours.

Among the questions of cosmical interest which have excited the attention of the scientific world lately, none is of higher or wider importance than the transit of the Planet Venus across the disc of the sun, which is to take place in 1874. For five years past, the attention of astronomers has been earnestly directed to preparation for the observations required. And every Government and people, deserving to be called enlightened, has aided in these combined operations.

The last transit of Venus took place in 1769, more than a century since; and it needs but little consideration of the immense improvements which have been made in the accuracy of construction of astronomical instruments, in the preparation of telescopes, and above all in the marvellously beautiful application of photography in self-recording instruments for such transient phenomena, to see that there is not only a well founded hope, but a certainty, that the determination of the elements of the vast calculations to be based on the phenomena will be far more careful and more accurate than before. Fortunately also, another transit will recur within a short interval or in 1882, and with the experience gained in 1874 and the extension of points of observation contemplated for 1882, we may I think confidently look forward to seeing that all-important determination of the distance of the earth from the sun established with extreme accuracy. On this, as is well known, depend all the dimensions of the solar system. The British Government have undertaken the provision of instruments and observers for five stations. These are selected with a special view to their value, as enabling the best observations to be carried on. These five stations are, Oahu in the Sandwich Isles, Kerguelen Island in the Indian Ocean, Rodriguez a dependency of Mauritius, Auckland in New Zealand and Alexandria. Of the three first in the list, the longitude is to be determined accurately by a whole year's series of observations. Further, owing to the distance, the parties of observers must leave England more than six months before the time of transit. Instruments alone will cost considerably more than £10,000, conveyance, pay, sustenance as much more. This may seem a large sum, but as compared with the object in view, it is as nothing. The acquisition of knowledge of so much importance to all civilized nations, and the seizing on an opportunity of rare occurrence for fixing some of the most important astronomical and cosmical questions alone would have justified, nay would have demanded, the outlay of almost any sum. And I have no reason to doubt, that the answer to the suggestion to carry out this most important observation in a fitting manner from the head of the Treasury in Great Britain would have been precisely the same, 'they have no objection to offer to the expenditure, were the sum required ten times what it is.'

In addition to the stations thus specially selected, the observatories of Melbourne, and Sydney, of the Cape of Good Hope, Madras and Bombay, will all be utilized. The whole sea board of the United States of America, and the Canadian localities will all be favourably situated for certain observations and we may safely trust that the well known energy and zeal of our American brethren will not fail them here. To supplement the observations in the southern Hemisphere, by others in the northern, we must look to the Russians who have in their widely spread territories many localities admirably adapted for such observations. For one special class of observations

indeed, observations of the egress of the planet as retarded by parallax, these localities will be essential. But the well known skill of the Russian astronomers leads to the most implicit confidence that no portion of the required observations will be omitted in their hands. Such, gentlemen, are a few of the preparations which have been in progress for the observation of this rare phenomenon. And I am happy in now being able to announce to you that the Government of India have, on representations made to them of the value of a series of observations especially photographic in the clearer atmosphere of some high elevation in North India, at once sanctioned the necessary expenditure for instruments, and have telegraphed for their immediate preparation.

In connection with this, the General Committee of the British Association at their meeting in 1872, August last, requested the Council to take such steps as seemed desirable to urge the Indian Government to prepare these instruments, with the view of assisting in the Transit of Venus in 1874. And they added,—and to this I would ask your special attention—“and for the continuation of solar observations in India.”

It may perhaps appear to some that we have quite enough experience of solar effects in this country without establishing an observatory for the special study of such facts. The intimate connection of what we speak of as the weather with changes on the solar surface, the remarkable statements lately put forth apparently with good ground, that the cyclones of the Indian Ocean and its more southerly extensions are also connected with these changes, and the bold assertion of a belief, by Mr. Maury, whose opportunities for observation have been unequalled, that he is fully convinced that changes in the seasons can be foretold with the aid of a properly conducted and sufficiently wide system of observations, all these facts tend to show the vast interests involved and the high importance which naturally attaches to such observations. And we cannot but express an ardent hope, that it may commend itself to the Government of this country to maintain and render permanent the small establishment about to be fixed on some elevated spot for the observation of the transit of Venus, and so form one observatory to be maintained for a special object and with a view to a continuous and sustained system of observations of those peculiar phenomena.

Col. Tennant, in submitting a brief statement of the advantages of such an observatory, has very justly insisted earnestly on the vast importance of determining beforehand the nature of the work to be done, and of carefully adhering to this system when once established. He pointedly refers to the glorious result of such a rigid adhesion to one object of work in the observatory of Greenwich, established with a special view to perfecting the art of navigation. Since the days of Charles the Second, the efforts of the astronomers of Greenwich have been without cessation devoted to building up what

Le Verrier has called that 'prodigious series of observations,' which may be taken as the fundamental bases of the theory of the moon. For now all but two hundred years have their efforts been devoted to increase and to preserve these glorious records. And the practically beneficent result to all civilized nations, and more especially to those much interested in navigation, have been almost incalculable.

I notice this point more prominently because I am thoroughly satisfied from experience now of many years in this country, that one of the great causes of the comparative failure of many well devised and for a time well carried out schemes of enquiry and observation has been this want of a maintenance of an established system fully thought out in the first instance and modified only so far as to improve and extend, without material alteration. This is unfortunately true of almost every department in this country. The agency is constantly changing and each successive occupant of a post thinks it incumbent on him to signalize his reign by some change, all the better if marked and defined. Another may succeed, and a certain amount of reversion to old systems be again introduced. But meanwhile half the value of the accumulated knowledge is gone, because it is not as it were referable to the same standard. This curious absence of any want of faith in the traditional systems of operation which is to a large extent due to the rapid changes in the controlling elements in this country, and to the absence of those permanent officers, which in England are the mainspring of the machinery, and maintain the works in steady operation, men who in the great offices at home are in reality those who keep the Government of the country going, forms a remarkable contrast to the perfection with which the mere paper records of former Governments are kept, records which however are with exceeding rarity, if ever, examined by new incumbents, until some difficult question be raised.

But if a well designed system be once established with reference to such solar observations, and such studies of the motions of the satellites as Col. Tennant proposes, there can be very little doubt, that most valuable results will arise from a sustained systematic observation, which could never be expected from desultory action and interrupted system.

And looking to the immense gain which would result from such an observatory being at considerable elevation, above the mist and clouds which encumber the lower strata of the atmosphere in these countries there can be but little doubt that those results will be clearer and less obscure than could be the case at any lower elevation.

It is hoped that the establishment of such an observatory might be made the means of instruction to many in practical astronomy, means at present entirely wanting in this country. That the people of this land can investigate such subjects with much success is well shown by the care and

accuracy with which eclipses are calculated, while the visitor to Delhi or Benares will not have failed to be struck and deeply struck with the noble remains of the observatories of old, and will have dwelt with grief on the decay of knowledge since the days when such wondrous erections were not considered too costly or extensive for astronomical observations. Indeed it would seem that the maintenance of such observatories is one of those things which commend themselves to the wealthier natives of this land. And if trained observers, accustomed to work with the improved instruments of modern days, were available, I think we would be justified in anticipating that in many places such would be utilized; and their results, guided into proper channels by advice and system, would prove most valuable adjuncts to any general system of investigation. It is certain, that the establishment of such an observatory does hold out hopes of a successful teaching of astronomy which have long been sought, but have never existed in this country.

Another noble undertaking on the part of the British Government, in which Indian naturalists and geographers are deeply interested, is the expedition of H. M. S. 'Challenger' for a three or four years' cruise, with a view to the investigation, by dredgings and other means, of the physical history of the bottom of the sea, its currents, its temperature, its depth. Looking to the wonderful results obtained by a similar expedition under the guidance of the veteran Agassiz round the south coast of America we are justified in anticipating for the well organized and fully equipped expedition of the Challenger results of the very highest importance to Natural History, to geology, and to physics. And we doubt not that these hopes will be fully verified. But we, in India, are especially interested in this expedition, inasmuch as we are, as it appears to me, bound to make every effort to supplement the researches of the Challenger, by similar investigations within our own waters. The Indian seas are not included, indeed have been excluded from the route adopted for the Challenger, and unless Indian naturalists can obtain the required information in other ways, there is no hope of obtaining it at all. A Committee of our Society has been organized for the purpose, as you are already aware; the necessary funds for the purchase of instruments have been granted, and these instruments are in progress; and it now only wants that a ship suited for the purpose may be placed at the disposal of the Committee, so that the work may be carried out. The ground to be examined is almost a virgin soil. There have not, that I am aware of, ever been any dredgings worth notice round our shores; and even the recent littoral conchology of the Indian seas is very slightly known. An immense area of country is now formed of rocks of comparatively very recent formation round the coast of India, and it is simply impossible that the study of their rich molluscan fauna can ever be carried out effectively until the recent and living molluscs of the existing ocean are better known.

It may probably interest some who have not followed out the preparation for these researches to mention briefly what has been done. The 'Challenger' is a steam ship of nearly 1,500 tons burden. Her warlike armaments are removed as she is going essentially on a mission of peace. She carries no less than 600 gallons of alcohol, and 120,000 fathoms of line for soundings, with an ample supply of tubes and cups and vessels, all specially designed for bringing up the sand, mud, shells, &c. from the bottom of the ocean. A whole armoury of thermometers and other instruments, dredges, harpoons, cages for animals, Wardian cases for plants, &c., &c., accompany. In addition to the officers who have all been selected for their special acquirements and who will carry on a complete series of magnetic observations, there is Dr. Thomson who is at the head of the scientific part of the expedition; Mr. Moseley and Dr. Von Seebein as naturalists; Mr. Buchanan as chemist; Mr. Wild, as artist, and a skilled photographer from the Royal Engineers. The route is to be to Gibraltar and Madeira, thence across the Atlantic to Bermuda, east again to the Azores and Canaries; west to Brazil, Trinidad, and then to the Cape of Good Hope. Thence she will proceed to Kerguelen Island, then to the Antarctic ice regions, to Australia, New Zealand: then she will visit the Coral Islands, New Guinea, Torres Straits, Manila and Japan. From Japan to Vancouver's Island and thence to Valparaiso, the Magellan Straits, Rio Janeiro, and England, where she is expected to arrive in 1876.

Surely if such an undertaking can be accomplished in England, the great Government of India can carry out the comparatively petty labours which would be the lot of naturalists working up and down in Indian waters.

Great pressure of other work, and I regret to say impaired health, have prevented my doing more than give you a very brief notice of some of the labours which have engaged the attention of the scientific world in India during the past year. I must ask your indulgence for its many shortcomings, and now conclude by thanking you very heartily for the kindly and ready support I have during the year invariably received from the members of the Society, and by wishing that the coming season may find the Society more prosperous and more successful. Experience of the past leaves no doubt as to the activity of its supporters in their various lines of research. We have only to trust that the needful funds may be available to enable their researches to be brought properly before the public.

The Meeting then resolved itself into an ordinary Monthly Meeting.

T. Oldham, Esq., LL. D., President, in the chair.

The minutes of the last meeting were read and confirmed.

The receipt of the following presentations was announced.

From the author, a copy of a Report on the Bladder Worms found in Beef and Pork, by T. R. Lewis, M. B.

On a Hæmatozoon inhabiting Human Blood, by T. R. Lewis, M. B.

A Report of Microscopical and Physiological researches into the nature of the Agents producing Cholera, by T. R. Lewis, M. B. and D. D. Cunningham, M. B.

2. From the Chief Signal Officer. Washington, U. S., Three weather charts.

3. From the author, a copy of a work entitled Sherpur Bivarana or an account of the Sherpur Pargana, District Mymensing, in Bengali, Part I. Descriptive Geography, by Harachandra Chaudhuri.

4. From the Royal Society of Tasmania, copy of results of 5 years Meteorological Observations for Hobart Town and of Practical Hints to Emigrants intending to proceed to Tasmania with a full description of the several countries and their products, and a paper on local industries by E. C. Nowell, Esq.

The following gentlemen duly proposed and seconded at the last meeting were balloted for and elected ordinary members.

R. R. Bayne, Esq.

T. R. Lewis, Esq., M. B.

The following are candidates for ballot at the next meeting.

A. Cappel, Esq., proposed by T. Oldham, Esq., LL. D., seconded by L. Schwendler, Esq.

A. J. Hughes, Esq., C. E., proposed by J. Wood-Mason, Esq., seconded by G. Nevill, Esq.

G. W. Barclay, Esq., proposed by H. Blochmann, Esq., M. A., seconded by W. L. Heeley, Esq., C. S.

Babu Satyadaya Banerji, B. L., zemindar, proposed by Babu Rájendra-lála Mitra, seconded by H. Blochmann, Esq., M. A.

The following gentlemen have intimated their desire to withdraw from the Society.

J. H. Newman, Esq., M. D.

J. C. Geddes, Esq., C. S., Puri.

The election of Col. H. Drummond, R. E., is cancelled at his own request.

Letters were read—

1. From the Assistant Secretary to the Government of Bengal, forward-

ing copies of the following correspondence on the earthquake felt at Kámrúp on the 19th December last.

No. 2688T, dated Sibságar, the 30th December, 1872.

From—COLONEL H. HOPKINSON, *Governor-General's Agent, North-East Frontier, and Commissioner of Assam.*

To—*The Officiating Secretary to the Government of Bengal, General Department.*

I have the honor to submit, for the information of Government, an extract from Major Lamb's diary of the 19th December, 1872, regarding an earthquake which occurred in the Kámrúp district on that date. I have not heard of the earthquake from any other district, but it appears to have been felt here (Sibságar) slightly, though I myself did not notice it.

Extract from the diary of MAJOR LAMB, Deputy Commissioner, Kámrúp.

Thursday, 19th December.—"On my way back to camp, just as I was emerging from the sál forest,* I heard a sound, which at first I took to be caused by the beating of a large number of dholes or tom-toms, in a village about a mile or more in front of me, a little to the west of north, but after listening for a couple of seconds the sound was evidently progressing rapidly southward, and towards the direction of my camp, which was a mile to the west of where I was at the time, and gradually changed into what one might imagine a strong current of electricity would produce in passing through the earth from pole to pole southwards, shaking and rattling rocks and dispersing fragments in its progress just below the surface of the ground, the huge boulders being hurled down some rocky incline and shaking the very foundations of the earth at each rebound, until at last the sounds became more indistinct and resembled the sound of heavily laden waggons, going with considerable rapidity over a rough hewn rocky road; and passed off like distant thunder. There was no more possibility of mistaking the direction the sound came from and went in, than there would have been if I had heard only guns fired in two distant places, for each report was distinct, and as the sound passed along, it disturbed first some people in the direction of the village I alluded to, and they set up a shout, next a flock of paddy birds was scared and rose *en masse*, and still further south and west a herd of cows grazing, suddenly ran together and faced the jungle to the north for a few seconds, and then all turned round and commenced a regular stampede till brought up by a blueel. My turn came next, I was in my howdah and had a pad elephant with me, on which sat a forest ranger who went to show me the teak plantation and reserve. The animals put up their trunks and stood still for a few moments, but hearing the subterranean sounds approaching, both turned and evinced an unmistakable desire to

* In mouzah Pantan.

seek refuge in the forest which was within a hundred yards of us. The mahout on my elephant, by pressing the point of a bit of bamboo he had to drive the animal with against its forehead, persuaded him to believe that there was more to fear from the front than the rear, and so the animal stood grumbling till the tremulous motion of the earth subsided and the rumbling ceased. I saw the pad elephant just disappearing into the forest with his riders, and sent men after them to pick the unfortunates up, if they chanced to have been thrown off, and waited some time, but as they did not appear, I continued my course back to camp, and had the satisfaction of seeing the runaway bringing his riders along at full speed in the same direction when I was near my tent. Being on an elephant, I did not feel the motion of the ground nor did I perceive the trees move or the earth undulate, but the villagers I spoke to, seemed to think it was more severe the further I proceeded; and I noticed fissures in the moist sand of the river all in the same direction (east and west) athwart the course of the earthquake. I was met by a number of natives on my arrival, and they informed me that it was here almost as severe an earthquake as that which occurred in 1869, and that the first smart shock had been followed by two slight ones at short intervals. I must have been just within the left or southern margin of the course the current passed along. To-morrow I hope to be able to ascertain how far northward the shock was felt."

2. From the Secretary to the Government of India, Home Department, (Public) forwarding a set of 24 photographs taken by Major R. Gill of the temples in the Buldāna and Bassein districts in west Berar.

The following extracts from Major Gill's notes accompanying the photographs are of interest.

Extracts from notes on Hemadpauti Temples &c., made during a tour through a portion of West Berar in 1868, 1869 and in May, 1871 by Major GILL.

JAIPUR KOTLI'.

At Jaipur Kotli, 14 miles north of Buldāna, are two old temples; the finest is in the centre of the village, and the smaller one outside at a short distance to the south-east. The general plan of the larger temple is in the form of a cross, with the larger arm to the west, and the entrance to the east. The portico which formed the east end, however, has now almost entirely fallen away. The south wing contains two small recesses, the outer one open at the top; the corresponding one in the north wing is only an enclosed recess containing a linga and yoni. The centre of the temple is fifteen feet two inches by fifteen feet one inch. In the centre of this the floor is slightly raised, forming a sort of square dais, at the corners of which are four columns eight feet eight inches in height, of the same style as those at

Vide photographs 26 and 27. the entrance, and supporting an architrave of one foot three inches deep, over which is a frieze one foot in height. This is ornamented with geometrical patterns on both faces, and with rosettes in the centres of the under sides. From the frieze rises the usual Hemadpauti dome ornamented with chaste shell pattern sculptures.

This temple is quite in the Jaina style of architecture of the early part of the 13th century.

AMDAPU'R.

Amdapūr is 20 miles east of Buldana, and about half a mile to the south of the village is a small hill bordered on the south and south-east by a deep picturesque ravine, and falling out into the plain by gentle undulations to the north and west. On the summit of this hill stands a fine modern temple dedicated to Bhowani, of whom there is an image bedaubed with red lead in the sanctuary which is curiously lit from above in such a way as to throw the full light upon the image, while the spectator sees it only through a chink in the door, and, the mandar being nearly dark, the effect may be somewhat startling to the ignorant.

Near this temple are seen some fragments of a large colossal statue.

Vide photograph 31. These are a pair of feet six and a half feet from toe to heel, and a hand to match, so that the statue may have been from fifty to sixty feet high. This enormous figure has not been a monolith, but built up in pieces, as is evident from the heel being separate from the fore part of the foot which includes the ankles. Over the foot there is an anklet but there is no indication of the toe-joints or of the extensor muscles over them, while the ankles are on a level with one another. Near them is another pair of feet somewhat smaller. The villagers say that a fine Hemadpauti temple formerly stood on the site of the present Hindu one; and this seems to be confirmed by the fragments built with it, and lying about in all directions.

SIRPU'R.

Sirpūr is 56 miles east of Buldana, and a short distance to the west of it is the temple. It is entered by porticoes on the north, south, and east sides. The doors are five feet four inches high, and two feet nine inches wide, and the porticoes are ten feet wide by nine feet six inches deep. These have been supported by two pillars in front and two pilasters, one on each side the door, corresponding with those inside. In the north portico a third

Vide photograph 35. pillar has been subsequently introduced to support the cross beam in front which had given way. In the centre of the temple are four columns nine and half feet and two feet three inches square at the base, forming a square ten feet nine inches on each side, in the middle of which is a low circular dais seven feet eleven inches in diameter. In

Vide photographs 33, 34, and 35. line with these pillars are pilasters on each wall, and in the corners are half pilasters.

MAHKAR.

Mahkar is nearly 28 miles west of Sirpúr. The temple is on the low spur of a hill, projecting from the lower or

Vide photographs 1st Series, 6, 7, 8, and 9 : 2nd Series, 37 and 38. west side of the town, and nearly almost to the level of the Pen Ganga River ; it consists of a square court 21 feet 10 inches on each side, descended to by two steps on each face, and is surrounded by a triple colonnade, consisting of 60 pillars in all, with 32 pilasters against the outer wall, one opposite to each row of columns. The entrance is by a small door in the east face. Including the colonnades the length is 73 feet 4 inches, and the breadth 72 feet

Vide photograph No. 38. 9½ inches. The columns in their general style resemble those in most of the oldest temples all over British India, and are almost copies of those that still remain of the very oldest of the Jaina temples in Guzerat. The base and lower third or two-fifths of the shaft is square ; on each side there rises from the plinth to the level of the upper side of the base a triangular facet, and this ornament is repeated in front of the double cincture and fillets that terminate the square portion of the shaft. The next member is a deep octangular band carved with leaves above which the pillar may be regarded as circular, rusticated by a square block and a thin octangular fillet carved with geometrical patterns. Above the block the shaft is cut into scotias and torusas interrupted by triangular facets on four sides. The capitals are thin with a narrow square fascine over a circular fillet and cyma recta, separated from the shaft by a torus. The capital is surmounted by a sur-capital of the quadruple-bracket sort so common in the Jaina temples at Gírnár and elsewhere. The style and construction of the roof also is identical with the oldest Guzerat temples, and was doubtless connected historically with the style of the same western buildings through the Chalukya dynasty of Devagiri, now Dewlatabad. The columns are nearly equidistant, varying from six feet five inches to seven feet one inch ; they do not exceed eight feet in height, and are so arranged that every four form a square of nearly one, and from capital to capital large slabs of stones are laid to support the roof. From centre to centre of these others are placed covering in the corners, and leaving a small square in the centre, the corners of which are again enclosed as before, leaving a still smaller square which is shut in by one large slab usually ornamented by a rosette in centre. Over this three or four feet of débris complete the roof.

In this building no cement of any kind has been used, as indeed lime was never employed by the Hindus before the Mahomedan invasion ; the stones are cut so as exactly to fit one upon another.

LONÁ'R.

At Lonár, nearly 12 miles south of Mahkur, there are several Hemadpauti temples and tanks, also a Hinúlu temple which has evidently been

originally a Hemadpauti, if no Buddhist's structure. Below this temple is a tank with flights of steps and terraces leading down to it. The water flows through the sculptured kind* of a bullock, and is fabled to come under ground all the way from the Ganges. People of all castes, men, women and children bathe promiscuously in it. The water is constantly removed as it passes through one aperture at the bottom as fast as it flows in. Below the Hindu temple is the salt lake leading down to which there has been a magnificent flight of steps, a large portion of which still remains.

Regarding this salt lake there is a wonderful legend of a giant named Lonásur who lived in a subterraneous abode, made by himself under a hill about a mile from the place where the village of Lonár now stands. When this monster had destroyed many human beings and animals, and threatened to overthrow even the gods, the latter became alarmed and supplicated Vishnu to relieve them from the danger. Vishnu assumed the form of a beautiful youth to gain over the assistance of the giant's two sisters. By their assistance he discovered the subterraneous dwelling, and with a touch of his toe he threw off the covering of the den and found the giant asleep. Engaging in single combat with him Vishnu slew him, and buried him in the very pit he had made his home: this was the present salt lake of Lonár. Its water is supposed to be his blood, and the salt is his decomposed flesh. A hill standing, according to the Berar Gazetteer, 36 miles to the south-west of Lonár, but according to my informant only about a koss from it, is said to be the lid of the den thrown off by Vishnu, and is reported to coincide in shape and size with the surface of the lake.

The lake is about a mile across, or three miles round, and is supposed to be the crater of an ancient volcano. Round the top of the basin is about five miles, and the sides slope abruptly down, and are covered with jungle and trees. Immediately round the lake are dense rings of tamarind, date, and babul trees, in which panthers, bears, and wild hog are frequently found, and in which pea-fowl generally abound. Nearly in the centre of the lake are two deep fissures hitherto unfathomed, through which impregnation takes place during the monsoon, when only pure crystals of salt (Dalla) are obtained from their edges by divers. But to enter these openings during the hot season would be certain death. Evaporation takes place to a very considerable extent during the hot season, and leaves a crystallized deposit (Papri) upon the surface that gives the lake the appearance of being frozen over. This deposit is carefully collected, as well as the earth (Bhnski) beneath it, which is also to a certain extent impregnated. These deposits are very valuable, and yield a

* Head?—Ed.

handsome revenue to Government. Dalla is sold at Rupees 85 per kandi; papri at Rupees 18 to Rupees 25; and bluski Rupees 8 to 10. The rent at present is Rupees 6,500 per annum on a three years' lease.

The finest temple is outside the village to the south within a mudwall. When I first visited it, more than twenty years ago, the whole basement was buried in debris, but the sculptures were far more perfect than they are now. The basement has been unearthed, and the temple otherwise thrown open, and now the first sight of it takes one by surprise.

Like those of Amruth and Somnath the whole exterior of this temple is one mass of sculpture, and the eaves and some of the borders are very beautiful; but though the quantity of sculpture is so great, the subjects are comparatively few,—gods of the Hindu pantheon, obscenity in its grossest forms, dancing girls and musicians, and all the paraphernalia of debauchery. Many of the groups visible twenty years ago have since been knocked off, a piece of Vandalism similar to that acted at Ellora where several statues were emasculated to save the blushes forsooth of two prudish ladies: but still traces remain to render it a case of "honi soit qui mal y pense."

The next Hemadpauti temple is to the north of the village, and midway

between it and the temple and tank; it consists of a portico with small wings at each end open in front, but enclosed on the other side and supported by three lines of columns and pilasters opposite each column in the third rank. It measures 102 feet by 20 feet, and there has been an enclosed building in a line with one of the wings. It is supposed to have been a place of almsgiving; the recipients occupy the portico while the victuals were cooked in the enclosure.

To the east of the large temple is a fine Hemadpauti tank.

Half way along the road to the salt lake is another very pretty temple, and there are four others in the margin of the lake, the three best of which are pictured in the photographs.

Vide photographs 1st Series,
Nos. 21, 22, and 23.

All these temples probably belong to about the 12th century when the Hindus seem to have been perfectly "mad upon their idols" and were only saved from utter degradation resulting therefrom by the iuroads of the iconoclastic followers of Islam.

DHOTRÁ.

Dhotrá is about 30 miles north by west from Lonár, and about half a mile south-east of the village stands a very fine temple, and near it are the remains of a splendid tank, which if cleared out would yield a plentiful supply of good water throughout the year to the poor villagers who have to go

nearly a mile to secure only a scanty supply of water. The mere ruin of a second lies to the west, and a third, much smaller but perfect to the north-west, on the outskirts of the village.

Vide photographs, Nos. 43, 44, and 45.

SA'TGA'M.

At Sâtgâm, 2½ miles west of Dhotrá, there are five Hemadpanti temples.

Vide photographs Nos. 2, 3 & 4, 1st Series; and 43, 49, 2nd Series.

Vide photograph No. 46.

The principal one is just outside the west wall of the village, and almost adjoining it. On the north side are the remains of a small but beautiful temple which appears to have been originally in the same enclosure.

The other three are closely within the village walls; the largest of them is merely an oblong apartment containing the Linga and Yoni and an

Vide photograph, No. 47. image of Ganesh. There has been a verandah in front supported by four columns; and the entrance has been elaborately sculptured. In the centre of this verandah is a large sculpture of Nandi. The next in size consists of four columns supporting the architraves, above which is the common simple roof. But the backs of the posterior pair of columns being only rough hewn, this may have only been the portico of another temple.

The fifth is only a small cell distinguishable as Hemadpanti only by the pilasters on each side of the entrance.

NOTES.

These temples are supposed by the natives to have been raised by demons in a single night, but from the title they generally bear they are ascribed to Hemad Kant or Hemadi Paut, who was prime minister to Ram Chandra Deva or Ram Deva Yade, the last of the Devagiri rajahs, of whom

Journal, Asiatic Royal Society, Vol. V., pages 178 and 188.

two copper-plate grants, dated respectively A. D. 1273 and A. D. 1291, have been published by Mr. Watham. He was also minister

in the reign of Madhao, the predecessor of Ram Deva and in possession of all the regal powers. Mr. Walter Elliot dates the ascensions of Madhao in A. D. 1261, of Ram Chandra in A. D. 1272, and of Shunkur Deva in A. D. 1311.

All these temples, as already remarked, are erected without any cement of any kind. The different pieces are fitted together with the greatest accuracy and partially secured by tenons and mortices left on and cut into the blocks. They have been built with distinct inner and outer facings much like modern Public Works Department works, only the stones were not played back; and so the work was more likely to be durable. The interior of the wall was then filled up with rubbish,—the perfection of the beds of the stones is evidenced by the length of time they have stood.

The style of lighting is wonderfully adapted to the character of the works and architectural features, all lights being raking strike only the edges of the endless angles, and the result is a subdued brilliancy which is exceedingly pleasing.

The natives say that beneath the lingas in these are buried heaps of treasures.

The receipt of the following communications was announced.

1. Note on two coins from Kausāmbhi by the Hon'ble E. C. Bayley C. S. I.
2. History of Pegu by Major General Sir A. P. Phayre, C. B., K. C., S. I.

LIBRARY.

The following additions have been made to the Library since the last meeting.

Presentations.

*** Names of Donors in Capitals.

Memoirs, Part II, Vol. XXXIX,

A. Savitsch.—Les variations de la Pesanteur dans les Provinces Occidentales de l'Empire Russe. Prof. Cayley.—On the Geodesic Lines on an Ellipsoid,—The second part of a Memoir on the Development of the Disturbing Function in the Lunar and Planetary Theories J. W. L. Glaisher.—On the Law of Facility of Errors of Observations, and on the Method of Least Squares.

THE ROYAL ASTRONOMICAL SOCIETY.

Monatsbericht, August, 1872.

Braun.—Nachträgliche Mittheilungen über die Gattungen *Marsilia* und *Pilularia* Peters.—Über eine Sammlung von Batrachiern aus Neu-Freiburg in Brasilien.

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN.

Bulletin, Octobre, 1872.

E. Masqueray.—Le Gulf Stream.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Schriften, 1869—72, Jahrgang 10—13, Abtheilung 1te.

Prof. E. G. Zaddach.—Beobachtungen über des Vorkommen des Bernstein und die Ausdehnung des Tertiärgebirges in Westpreussen und Pommern. J. Schumann.—Preussische Diatomeen. Dr. A. Hensche.—Der Gräberfund bei Fürstenwalde. Dr. G. Berendt.—Ein geologischer Ausflug in die Russischen Nachbar-Gouvernements, Rob. Caspary.—Anhang, Pflanz Abies, L. Arnold Ohlert.—Zusammenstellung der Lichenen der Provinz Preussen. C. G. A. Brischke.—Die Hymenopteren der Provinz Preussen. A. Müller.—Ueber drei in der Provinz Preussen ausgegrabene Bärenschädel. Paul Schiefferdecker.—Der Begräbnissplatz bei Stangenwalde. Dr. H. v. Klinggräff.—Beschreibung der in Preussen gefundenen Arten und Varietäten der Gattung Sphagnum. Ernst Dorn.—Die Station zur Messung von Erdtemperaturen zu Königsberg.

THE ROYAL PHYSICO-ECONOMICAL SOCIETY OF KÖNIGSBERG.

La Langue et la Littérature Hindoustanie, en 1872: Rhétorique et Prosodie des Langues de L'Orient Musulman, par M. Garcin de Tassy.

THE AUTHOR.

A Report on the Bladderworms found in Beef and Pork, by T. R. Lewis, M. B. :—A Report of Microscopical and Physiological Researches into the Nature of the Agent or Agents producing Cholera, by T. R. Lewis, M. B. and D. D. Cunningham, M. B. ;—On a Hæmatozoon inhabiting Human Blood: its relation to Chyluria and other diseases, by T. R. Lewis, M. B.

THE AUTHORS.

Sherepur Bivarana, part I, Geography, by Harachandra Chaudhuri.

THE AUTHOR.

The Rajahs of Rajshahiye, by Kissory Chand Mittra.

THE AUTHOR.

Results of Five Years' Meteorological Observations for Hobart Town, by F. Abbott; Practical Hints to Emigrants to Tasmania.

THE ROYAL SOCIETY OF TASMANIA.

War Department Weather Charts.

THE CHIEF SIGNAL OFFICER OF WASHINGTON, U. S.

The Christian Spectator, Vol. II, Nos. 19, 20.

THE EDITOR.

Ramáyana, Vol. III, part 4. Edited by Hemchandra.

THE EDITOR.

Memoirs of the Geological Survey of India, Palæontologia Indica, Vol. IV. 2.

Dr. F. Stoliczka.—Cretaceous Ciliopoda of Southern India.

THE Supt. of the Geological Survey of India.

Report on the Administration of Bengal, 1871-72.

THE GOVERNMENT OF BENGAL.

Exchange.

The Athenæum, Oct. and Nov., 1872.

Nature, Nos. 166—168.

Purchase.

Revue des Deux Mondes, 15 Nov., 1 Dec., 15 Dec., 1872.

Comptes Rendus, No. 19, 1872.

M. Th. du Moncel.—Note sur les Courants accidentels qui naissent au sein des lignes télégraphiques dont un bout reste isolé dans l'air. M. Gracé-Culvert,—Sur le pouvoir que possèdent plusieurs substances d'arrêter la putréfaction et le développement de la vie protoplasmique. M. A. Doran.—Sur les propriétés fébrifuges et antipériodiques des feuilles du Laurier d' Apollon. M. E. Ferrière.—Sur les causes de fièvres intermittentes et les moyens de les combattre. M. Picot.—Sur les propriétés antifermentescibles du silicate de soude. M. Carbonnier.—Sur la reproduction et le développement du poisson télescope, originaire de la Chine.

No. 20, 1872.

M. Becquerel.—Mémoire sur l'origine solaire de l'électricité atmosphérique. *M. Durest*.—Études sur les types ostéologiques des Poissons osseux.

No. 21, 1872.

M. Tresca.—Note sur la forme qu'il convient de donner aux mètres que la Commission internationale doit construire. *M. Bouillaud*.—Sur la théorie de la production de la chaleur animale. *M. Jeannel*.—Recherches sur la production naturelle des azotates et des azotites. Application de l'engrais minéral à l'horticulture. *M. E. Bertin*.—Étude sur la ventilation d'un transport écurie. *M. Léon Vaillant*.—Sur la distribution Géographique des *Percina*. *M. F. Tisserand*.—Sur la planète (116) *Sirona*. *M. J. Bourget*.—Théorie mathématique des expériences acoustiques de Kundt. *M. Casin*.—Sur l'énergie magnétique. *M. L. Cailletet*.—Recherches sur l'acide carbonique liquide.

Nos. 22, 23, 1872.

M. Th. du Moncel.—Sur les courants accidentels qui naissent au sein des lignes télégraphiques dont un bout reste isolé dans l'air. *MM. A. Rabuteau et F. l'apillon*.—Des effets thérapeutiques du silicate de soude. *M. L. Vaillant*.—Sur la valeur de certains caractères employés dans la classification des Poissons.

Journal des Savants, Novr. 1872.

M. J. Bertrand.—Théorie mathématique de l'électricité. *M. Dulaurier*.—Historiens anciens et modernes de l'Arménie.

Revue Archéologique, XI, 1872.

M. V. Guérin.—Deconverte du Tombeau des Maccabées au Khirbet-el-Medieh jadis Modin.

Revue et Magasin de Zoologie, No. 10, 1872.

Dr. Jousseume.—Étude des genres *Tuinostoma*, *Cyclostrema* et *Skenoa*. (Several Indian species are described).

The American Journal of Science, No. 22, 1872.

C. H. F. Peters.—Discovery of a new planet.

No. 23, 1872.

Joseph Leconte.—A Theory of the Formation of the great Features of the Earth's Surface. *C. A. Young*.—Catalogue of bright Lines in the Spectrum of the Solar Atmosphere. *J. C. Draper*.—Growth or Evolution of structure in seedlings.

The Ibis, October, 1872.

A. V. Wallen.—On a collection of birds recently made by Mr. A. H. Everett in North Borneo. *O. Salvin*.—Index to Ornithological Literature of 1871.

The Annals and Magazine of Natural History, Dec. 1872.

O. P. Cambridge.—On a new family and genus and two new species of Thelyphonidea, from Ceylon. *Dr. A. Gunther*.—On some new species of Reptiles and Fishes collected by J. Breachley in Mongolia, Fejee Islands &c. *Dr. A. Gunther*.—On *Psammoderma* and *Cnidon*. *C. Ritsema*.—On *Crinodes Sommeri* and *Tarsulepis Remicanda*, in answer to Mr. Butler's remarks.

Conchologia Indica, Part 5.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR MARCH, 1873.

The Monthly General Meeting of the Society was held on Wednesday, the 5th instant, at 9 P. M.

T. Oldham, Esq., LL. D., President, in the chair.

The minutes of the last meeting were read and confirmed.

The receipt of the following presentations was announced.

1. From the Government of Bengal, a set of six Photographs of Antiquities of Dinájpúr, by J. H. Ravenshaw, Esq., C. S.

2. From the Chief Commissioner of Mysore, 2 lithographed copies of each of the following transcripts in Sanskrit of the Gauja Agrahar and Koppa Gadde Sásanas.*

अथत्याविष्कृतं विष्णोर्वाराहं चोभितार्णवं ।

दक्षिणोन्नतदंष्ट्राये विश्रान्तं भुवनं वपुः ॥

स्वस्ति समस्तभुवनाश्रय श्रीशृङ्खोवज्रम महाराजाधिराज परमेश्वर परमभट्टारक हस्तिनापुर वराधीश्वर आद भगदत्तरिपुरायकान्नादत्तवैरिवैधयपाण्डवकुलकमलमार्गाण्डकदनप्रचण्ड-
कलिक्रकोदण्डगण्डमार्गाण्ड एकाङ्कधीररणरङ्गधीर अक्षपतिराय दिगम्बरायगजपतिरायमंहा-
रकनरपतिरायमलकतलप्रदारिद्र्याकृष्टप्रौढरेखारेवनसामन्तस्यगचामरकोङ्कणचातुर्दशभय-
करनित्यकरपराङ्गपवसुवर्षवराहलाञ्छनध्वजसमस्ताराजवलिविराजितसमालङ्कृत श्रीसोम-
वंशोद्भवपारोक्षितचक्रवर्ति तस्य पुत्र जनमेजयचक्रवर्ति हस्तिनापुरे सुखमुत्कथाविनोदेन
राज्यं करोति दक्षिणदिग्विजययात्रेयं विजयं करोमि तुङ्गभद्राचरिद्रामङ्गमे श्रीहरिहर-
देवमन्त्रिधौ कटकमुकुलितचैत्रमासे कृष्णपक्षे श्रमावास्यां सोमवारे भरणीनक्षत्रे किन्नरकरणे
उत्तरायणसङ्क्रान्तौ अतीपातनिमित्ते सूर्यपर्वणि अर्धप्रागट्हीतसमये सर्पयागं करोमि
वनवासि पंनिष्ठाहसमथे खण्डसान्तलिङ्गे साहसमूर्धं गौतमयामात् ब्राह्मणकन्नडशाखेयं
गौतमगोत्रद्वेगोविन्दपट्टवर्दनरं । कन्नडशाखेयवशिष्टगोत्रद्वामनपट्टवर्दनरं कन्नडशाखेय-
भारद्वाजगोत्रद्वेकेश्वयज्ञदीक्षितरं कन्नडशाखेयश्रीवत्सगोत्रद्वानारायणदीक्षितरं चतुर्मुख-
नानागोत्रेभ्यो द्वात्रिंशत्साहसब्राह्मणसर्पयागपूर्णाङ्किततदङ्गसमये मन्त्राङ्गप्रणवं करोति—

चक्रवर्तिनेषु पञ्चाङ्गपमाय इवसुखामनबलदग्दिगे अङ्गदण्डखण्डननाडुविहिगुलीसूक्तं अष्ट-
भोगतेजस्साम्यगौतमग्राम तन्मध्यप्रविष्टनाड नाडवन्नि बाडवन्नि चिकुहारिक दाणं दूरतलंगेरे
सन्निगाड तोगरगुञ्जि आलूर बाचेनहन्नि चंपगोडुकिरचंपगोडपडु एवं द्वादशग्रामात् सर्वं
समस्य धारापूर्वकं दत्त—तस्य ग्रामस्य सीमान्तराणि कथन्तु सान्यदक्षीमे गौतमग्रामदक्षिणपूर्व
अतिसन्निधीमासञ्चरिखेतसङ्गम— तथा दक्षिणमवल्लोके गौतमग्रामदक्षालिपूर्व द्वे सीमे यं
विगोल— तथा पश्चिम—गौतमग्रामदक्षालिपूर्वदक्षीमेखेतप्राप्य— तथा दक्षिणगौतमग्राम-
मदक्षालिपूर्वदक्षीमे जयं गुंडे विद्यतटाक—तथा दक्षिणगौतमग्रामदक्षालिपूर्वदक्षीमे
खेतप्राप्य— तथा दक्षिणग्राम आग्नेयगौतमग्रामदक्षालिपूर्वकाण्णपुरदक्षिणसन्निधीमे उभय-
गिरिमध्ये आग्रनगोदि— तथा पश्चिममवल्लोके गौतमग्रामदकाण्णपुरदक्षीमे कडवद-
कोल— तथापश्चिमगौतमग्रामदकाण्णपुरदक्षीमे सञ्चरिखेतप्राप्य—तथा पश्चिमगौतम-
ग्रामदक्षाल्य दूरविषमन्निधीमे कंतकोकट— तथापश्चिमगौतमदक्षीमे माख्यदूरदक्षीमेकप्य-
कुमारेडि— तथापश्चिम—गौतमग्रामदक्षाल्य दूरमंधासुरदक्षिणसन्निधीमे लवणखेतप्राप्य—
तथा पश्चिमग्रामनैष्ठ्यगौतमग्रामद अम्भासुरगुंद्वासदक्षिणसन्निधीमे लवणनदोखेतसङ्ग-
म— त उत्तरमवल्लोके गौतमग्रामदक्षाल्यगुंद्दक्षीमे खेतप्राप्य— तथा उत्तरगौतमग्रामद-
क्षाल्यगुंद्दविदरगुंजियविषमन्निधीमेउभयगुंडु— तथा उत्तरगौतमग्रामविदरगुंजेयदक्षीमे
खेतकोल— तथा उत्तरगौतमग्रामदक्षिणगुंजियविषमन्निधीमे लवणखेतप्राप्य—
तथा उत्तरगौतमवायव्यगौतमग्रामदक्षिणगुंजियपोल्लदक्षीमे सन्निधिरियच्छेत्— तथा पूर्वमव-
ल्लोके गौतमग्रामदक्षिणगुंजियपोल्लदक्षीमे कंतकोकटुबिल्लियमन्ति— तथापूर्वगौतमग्रामदक्षि-
णगुंजियपोल्लदक्षीमेकगोल— तथा पूर्वगौतमग्रामदक्षिणगुंजियपोल्लदक्षिणविषमन्निधीमेकक-
गुंडु— तथा पूर्वगौतमग्रामदक्षिणपूर्वदक्षीमे गिरिप्राप्य— तथा पूर्वगौतमग्रामदक्षिणपूर्व-
उददक्षिणसन्निधीमेगिरिउत्तरे सुरकोल—पूर्वगौतमग्रामदक्षाल्यदक्षिणपूर्वविषमन्निधीमे विदर-
मचूनगौतमग्रामदक्षिणपूर्वदक्षीमे मोरटिपूर्वसद्यं तत्प्राप्य पूर्व ईशान्यसोमा समाग्निः ॥

सामान्योऽथ धर्मसेतुर्धर्माणां काले काले पालनयोगो भवद्भिः ।

सर्वानेतान् भाविनः पार्थिवेन्द्रान् भूयो भूयो याचते रामचन्द्रः ॥ ६ ॥

दानपालनयोर्मध्ये दानाच्छ्रेयोऽनुपालनं ।

दानात् स्वर्गमवाप्नोति पालनादद्भुतं पदं ॥ ६ ॥

मद्भ्रंशजः परमहोपतिवंशजा वा ये भूमिपास्ततमज्जलधर्मचिन्ताः ।

मद्भर्ममेव सततं परिपालयन्ति तत्पादपङ्कजमहं शिरसावहामि ॥



अयत्नाविष्कृतं विष्णोर्वाराचं सोभितार्णवं ।

दक्षिणोन्नतदंष्ट्रापे विश्रान्तं भुवनं वपुः ॥

सस्ति समस्तभुवनत्रयं श्रीशृङ्खलभं मङ्गराजाधिराजपरमेश्वरपरममहार्कदक्षिणा-
पुरवराधीश्वर आरोहकभगदत्तरिपुरासकान्तादत्तवैरिवैधव्याप्यबकुलकमलमाताण्डकदन-
प्रचण्डकलिङ्गकोदण्डगङ्गामार्माण्ड एकाङ्गवीर रणरङ्गधोर अक्षयतिराय दिशपट्टगजपतिराय

संहारकनरपतिरायमल्लकतलप्रहारिसामन्तगणामरकोङ्कणचातुर्दिसभयकरचचपुटचाच-
पुट ईसरमुखकमलविनिर्गतसुधसालङ्कारप्रज्ञवीणादत्तरणसप्रविण कोरंटकस्थलिनार्जु-
नादिमन्त्रव्यसिद्धप्रसिद्धसमुदयनमितपादारविन्दश्चिरायकुलविलयकालानलनित्यकरप-
राङ्गनापुत्र सुवर्षवराहलङ्घनध्वजसमसाराजावलिविराजितसमालङ्कृत श्रीमोमवशेद्भ-
वपरिचितचक्रवर्ति तत्पुत्र जनमेजयचक्रवर्ति हस्तिनापुरे सुखमंकायाविनोदेन राज्यं
करोति दिग्विजयं करोमि तुङ्गभद्राहरिद्रासङ्गमे श्रीहरिहरेश्वरसन्निधौ कटकमुकुलित-
चैवमामे कृष्णपद्मे सोमवारे भरणीमहानक्षत्रे सङ्क्रान्तिश्रुतिपातनिमित्ते सूर्ययागं करोमि
वनवासे पत्नीश्चहसमधासपण एदनाद् एष्यतरमन्मथे पुष्यगद्देयग्रामप्राप्ताएकद्रुडसाखेय
आवेयगोचद् माधवपट्टवर्धनर कनडसाखेय वसिष्ठगोचद्सङ्कररघुनिसर कनडसाखेयश्रोवत्स-
गोचद्दयोगेश्वरपट्टवर्धनर कनडसाखेयविश्वामित्रगोचद्दवीष्णोद्विषतश्च उधमजनानागोच-
द्दसहस्रद्वयप्राङ्गणं सूर्ययागपूर्णाहुतिसमर अग्निर्वाद्पूर्वकं चक्रवर्तिमेषिपञ्चाङ्गपसायहव-
सुखासनयल्लदग्दिगेष्मकदण्डखण्डण अष्टतोगतेशसाम्यं सर्वं नमस्य गगिपुष्यगोड्ये ग्रामात्त-
न्मथे प्रविष्टवोष्मनहजिनिष्टकान्देय कोरकोडी अन्नगोड्यकोडलीकेरेउरगेषणकुसुवलीक-
दडेयहली एवं दसग्रामात्प्राधारपूर्वकं दत्त तस्य ग्रामस्य सोमान्नराणि कर्षदसान्य-
दसीमे पुष्यगड्येयकान्नापुरदहरेयचिसम्बिसीमेसोतसङ्गमतथादक्षिणमवल्लोके पुष्यगद्देय
हारेयदेसीमे सोतप्राप्य तथा दक्षिणपुष्यगद्देयहारेय उदरेयचिसम्बिसीमे तवक तथा दक्षिण-
पुष्यगड्येय उदरेयहसीमेसोतप्राप्यदक्षिणग्रामप्राप्तेयपुष्यगड्येय उदरेयकदलीगेयसोतथा
तवक्रतथा पश्चिममवल्लोके पुष्यगड्येयकदक्षिणगद्देसिमेसचियकोलतथा पश्चिमपुष्यगड्येयकद-
क्षिणतवनिचियचिसम्बिसीमेबालयकोल तथा पश्चिमपुष्यगड्येयतवनिधियदेसीमे रलवदकद्रु
तथा पश्चिमग्रामात्तुनिरवतिपुष्यगड्येयतवनिधियदेसीमेसोतचक्रवर्तिचिसम्बिसीमे सोल्लेयमोरडि तथा
उत्तरमवल्लोके पुष्यगड्येयतेङ्करदेसीमेसायोवततेवक्रतथा उत्तरपुष्यगड्येयतेकोरकूलगनचि-
सम्बिसीमे सागेर तथा उत्तरपुष्यगड्येयकूलगनदेसिमेउधगड्ये तथा उत्तरग्रामवायव्यपुष्य-
गड्येयकोलगनडोसकरचिसम्बिसिमेसोत तथा पूर्वमवल्लोके पुष्यगड्येयवसकरदेसिमेसोत-
प्राप्य तथा पूर्वपुष्यगड्येयवसकरताणगुप्येयचिसम्बिसीमेपालगोल तथा पूर्वपुष्यगड्येयताण
गुप्येयदेसीमेसोतवक्र तथा पूर्वपुष्यगड्येयताणगुप्येयतिसम्बिसीमेसोत तथा पूर्वपुष्यगड्येय-
कान्नापुरददेसिमेपूर्वं तथानुसान्यसीमे समाप्तः ॥

सामान्याऽयं धर्ममेतुर्ह्येषाणां काले काले पालनीयो भवद्भिः ।

सर्वानेतान् भाविनः पार्थिवेन्द्रान् भूयो भूयो याचते रामभद्रः ॥

खदत्तां परदत्तां वा यो हरेत वसुध्वरां ।

षष्टिर्वर्षसहस्राणि विष्टायां जायते क्रि(श)मिः ॥

(ब्रह्मसं हि) विषं घोरं न विषं विषमुच्यते ।

विषमेकाकिनं हन्ति ब्रह्मसं पुत्रपौत्रकं ॥

श्रीरामनाथदेदभुसामचरुम

3. From the Editor, A copy of Meghaduta with commentaries, edited by Bábu Pránanáth Pandit.

4. From the Director General of Geological Survey of England and Wales, A copy each of several earlier Memoirs of the Survey with maps, &c.

5. From the Chief Signal Officer, Washington, U. S. Three copies of the tri-daily Weather Bulletin.

6. From F. H. Pellew, Esq., C. S., specimens of wood and soil dug out near Baddibati, District Húgli.

The following letter accompanied the donation.

"I send you three specimens. 1st of wood cut from a prostrate stem of a tree found in a stratum about five feet below mean sea level—or at the level of low tide—and about 25 feet below the present surface of land at Baddibati; 2nd, of twigs found in the same stratum; and 3rd, of some consolidated earth at a little higher level—believed by some to be of vegetable origin, though I think it is only clay. These were found in excavations for the Húgli drainage works, which I visited this morning. The logs or prostrate stems are pretty numerous, the wood, as you will observe, is quite soft and is cut clean through with the spade; below the stratum is a soft greasy blue clay,—above are alternate strata of clay and sand. I have asked the engineer to look for littoral shells, which I looked for, but could not find. The prostrate trees look like trees stranded on a muddy beach of shore of a deltaic estuary. I have seen hundreds such near the mouths of the Sunderban khalls lying half buried in the same sort of mud.

The importance of the 'find' lies in the fact that it proves, so far as it goes, that the Delta has not sunk since the deposition of this stratum.

I would suppose that the land at Baddibati was then low estuary land with tidal creeks, such as the land east of Saugor Island is now, and that the Damúda and Ganges have since that period simply covered over this low land with strata of sand and clay at the same time pushing forward the shore. In other words that there has been nothing abnormal, no subsidence, at any rate.

This is contrary to the evidence afforded by other borings, but the question is whether the levels in the other cases were accurately taken. If they were, then the upright trees, &c. discovered far below the present sea level in those other cases, must be much more ancient than these—or else there must have been partial subsidences confined to particular localities."

The President remarked on the interest attaching to all such notices of change of condition of surface, more especially when it was possible, as in this case, to determine the levels accurately. But he would advise much caution in attempting to apply conclusions derived from such very local changes in a great delta to the delta at large. Such appearances of elevation

or depression are often very deceptive, and require great care in their application.

6. From the Government of India, a set of 19 works on the East African dialects by Dr. Steere of the English Mission in Zanzibar.

The following gentlemen duly proposed and seconded at the last meeting were balloted for and elected Ordinary Members—

A. Cappel, Esq.
G. W. Barclay, Esq.
A. J. Hughes, Esq., C. E.
Bábu Satyadayála Banerjea, B. L.

The following are candidates for ballot at the next meeting—

Frederick Jones, Esq., C. S., proposed by J. Wood-Mason, Esq., seconded by G. Nevill, Esq.

Edmund White, Esq., C. S., proposed by A. M. Markham, C. S., seconded by H. Blochmann, Esq., M. A.

Robert Turnbull, Esq., proposed by Bábu Rájendralála Mitra, seconded Col. A. S. Allan.

Babu Umesh Chunder Dutt, proposed by Col. A. S. Allan, seconded by Bábu Rájendralála Mitra.

T. T. Blissett, Esq., proposed by L. Schwendler, Esq., seconded by T. Oldham, Esq., LL. D.

J. W. Curtoys, Esq., has intimated his desire to withdraw from the Society.

The President reported on the part of the Council that the following gentlemen have been appointed to serve on the several Committees of the Society:—

FINANCE.

Bábu Rájendralála Mitra.
L. Schwendler, Esq.

Col. H. Hyde, R. E.
Col. A. S. Allan.

LIBRARY.

The Hon'ble J. B. Phear.
Bábu Rájendralála Mitra.
Col. H. Hyde, R. E.
Col. A. S. Allan.
W. L. Heeley, Esq., C. S.

J. Anderson, Esq., M. D.
J. Wood-Mason, Esq.
G. Nevill, Esq.
Dr. Mahendralal Sirkar.
L. Schwendler, Esq.

PHILOLOGY.

The Hon'ble E. C. Bayley, C. S. I.
 Bábu Rájendralála Mitra.
 W. L. Heeley, Esq., C. S.
 C. H. Tawney, Esq.
 Major General A. Cunningham, C. S. I.
 Rev. K. M. Banerjea.
 Bábu Gour Dass Bysack.
 Dr. Mahendralál Sirkar.
 Moulavi 'Abdul Latif Khan Bahádur.
 Moulavi Kabíruddín Ahmad Sáhíb.
 J. Beames, Esq.
 F. S. Growse, Esq.
 Babu Dvijendranáth Tagore.

NATURAL HISTORY.

J. Ewart, Esq., M. D.
 J. Anderson, Esq., M. D.
 W. S. Atkinson, Esq.
 J. Wood-Mason, Esq.
 G. Nevill, Esq.
 H. F. Blanford, Esq.
 W. T. Blanford, Esq.
 V. Ball, Esq.
 H. B. Medlicott, Esq.
 D. Waldie, Esq.
 G. E. Dobson, Esq., B. A., M. B.
 Dr. Mahendralál Sirkar.

PHYSICAL SCIENCE.

His Excellency Lord Napier of Magdala, G. C. B., G. C. S. I.
 Col. H. L. Thuillier, C. S. I.
 Col. H. Hyde, R. E.
 H. F. Blanford, Esq.
 D. Waldie, Esq.
 J. Wood-Mason, Esq.
 L. Schwendler, Esq.

COINS.

Hon'ble E. C. Bayley, C. S. I.
 Bábu Rájendralála Mitra.
 Major-General A. Cunningham, C. S. I.
 Major F. W. Stubbs.

Rev. M. A. Sherring.
J. G. Delmerick, Esq.

THE COMMITTEE OF PAPERS.

The Members of Council.

The President said that the letter he was about to read to the members of the Society would explain itself. They were aware that a claim submitted to the Government of India by the Council for rent of the house they occupied as a Museum, from the date at which Government had contracted to relieve the Society of these collections, had been for a long time under the consideration of Government. They would therefore hear the result with great satisfaction at finding that Government had assented to the claim of the Society in full.

No. 68.

*From J. GEOGHEGAN, Esq., Under Secretary to the Government of India,
Department of Agriculture, Revenue and Commerce.*

To the HONORARY SECRETARY to the Asiatic Society of Bengal.

Calcutta, dated 1st March, 1873.

(Industry, Science and Art.)

SIR,—With reference to your letter to the address of the Government of India in the Home Department, No. 47, dated the 29th January, 1872, on the subject of compensation for the loss of house accommodation consequent on delay in completing the new Museum building at Calcutta, I am directed to say that after full consideration of the circumstances of the case, His Excellency the Governor-General in Council is pleased to accede to the request of the Committee of the Asiatic Society, and to grant the Society a special allowance of Rs. 400 per mensem from the date fixed by law for the removal of the Museum collections, up to the date on which they may actually be removed.

I have the honor to be,

Sir,

Your most Obedient Servant,

J. GEOGHEGAN,

Under-Secretary to the Government of India.

Read a letter from F. S. Growse, Esq., M. A., C. S., on the proportion of the Muhammadan and Hindú population of the village of Dotána near Mathurá.

‘On the high road between Delhi and Mathura, and about 22 miles from the latter city, is the village of Dotána, noticeable in this peculiarly Hindú part of the country for having as many as 715 Muhammadans, out of a total population of 1411. Scattered about in the fields by the road side are a number of Muhammadan buildings, mosques, tombs and dargáhs, which

though of no architectural beauty, are sure to attract the notice of the traveller. John de Laët in his "India Vera" (1631) refers to it though he wrongly calls it Akbarpur, which is the name of the next village—and says "This was formerly a considerable town; now it is only visited by pilgrims who come on account of many holy Muhammadans buried here." Annual fairs are still held in honour of three of these holy men, by name Hasan Sháhí, Sháh Nizám-ud-dín and Pír Shakar-ganj, *alias* Bááb Farid.* The present zamindárs, who are in rather reduced circumstances, can tell me nothing about them and probably they were only local celebrities.'

The following papers were read—

- 1.—*Note on two Coins from Káusámbhi.*—By THE HON'BLE E. C. BAYLEY, C. S. I., C. S.

(Abstract.)

The Hon'ble E. C. Bayley explained to the meeting the legends of two ancient coins received by him from Káusámbhi, a ruined city in Alláhábád District. They appear to belong to the second century before Christ.

A wood-cut of the coins is in course of preparation.

- 2.—*The History of Pegu.*—By SIR ARTHUR P. PHAYRE, K. C. S. I., C. B. (Abstract.)

This paper on the history of Pegu is chiefly derived from a MS. history, written in the Taláing language. It includes the early legends as to the building of the city of Tha-htun, called also Suvarna Bhumi, by colonists from ancient Kalinga or Talingáná. This was before the death of Gautama Budha, B. C. 545. Pegu was founded by emigrants from Tha-htun A. D. 573, and the present paper follows the history of that kingdom until the death of king Rádzádirít, in the year 1421 A. D.

The author also discusses the physical characteristics of the Taláings (a word derived of Talingáná) or Mon people, and the affinities between their language and that of the Munda Kols of Chutiá Nágpúr.

The reading of the following paper was postponed.

- On the identification of certain Aboriginal Races noticed in Col. Dalton's Ethnology with those mentioned in Sanskrit works.*—By BA'BU RANGALA'L BANERJEE, Deputy Magistrate, Húgli.

The receipt of the following communications was announced—

1. New Burmese Plants, P. II., by S. Kurz, Esq.
2. On the Indian species of the genus *Thelyphonus*, by Dr. F. Stoliczka.
3. Notes on Malayan Amphibians and Reptiles, by Dr. F. Stoliczka.
4. The Initial coinage of Bengal, P. II., by E. Thomas Esq. F. R. S.

* Evidently 'jawábs' of the tombs of Hasan, son of 'Alí, Nizámuddín Auliá of Dihlí, and Farid ud-dín 'Attár of Pák Patan. THE EDITOR.

LIBRARY.

The following additions have been made to the Library since the last meeting held in February last.

. Names of Donors in capitals.

Presentations.

Bulletin de la Société de Géographie, Novembre, 1872.

Vivien de Saint Martin.—Essai sur les Castes dans l'Inde, par M. Esquer.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Journal Asiatique, Juin, Juillet, Août-Septembre, 1872.

M. Joseph Halévy.—Traduction des inscriptions Sabéennes, suivies de trois appendices.

M. J. Oppert.—Pasargades et Mouvehâb.—Interprétation d'une inscription d'Artaxerces II, Mémon, trouvée à Susa. M. G. Panthier.—Étude de l'alphabet Cambodgien et manuel pratique de la langue Cambodgienne, par M. G. Janneau.

M. Francis Garnier.—Chronique royale du Cambodge. M. Ch. Clermont-Ganneau, —Résultats topographiques et archéologiques des fouilles entreprises à Jérusalem par le PALESTINE EXPLORATION FUND. G. Garret.—Ueber das Saptacathakam des Hâla, Ein Beitrag zur Kenntniss des Prâkrit, von Albrecht Weber. S. Guyard.—Note sur le chapitre du FARHANG I SJEHANGINI relatif à la dactylonomie.

THE ASIATIC SOCIETY OF PARIS.

Entomologische Zeitung, herausgegeben von dem Entomologischen Vereine zu Stettin, Jahrgang 1840-1872.

THE ENTOMOLOGICAL SOCIETY OF STETTIN.

Magnetische und Meteorologische Beobachtungen auf der K. K. Sternwarte zu Prag im Jahre, 1869-1871.

THE IMPERIAL OBSERVATORY OF PRAGUE.

Bollettino Meteorologico ed Astronomico del Regio Osservatorio dell'Università di Torino, Anno 1872.

THE ROYAL ACADEMY OF SCIENCES OF TURIN.

Katalogos ton Arkaion Nomismaton, 'Tomos A'; Apologismos toy Ethnikoy Arkailogikoy Moyesioy.

THE NATIONAL LIBRARY OF ATHENS.

Ofversigt af Kongl. Vetenskaps—Akademiens Förhandlingar, 1869, 1870.

Kongliga Svenska Vetenskaps—Akademiens Handlingar, Bd. 7-8-9.

Lefnadsteckningar öfver Kongl. Svenska Vetenskaps Akademiens, Bd. I

Meteorologiska Jakttagelses i Sverige, 1867, 1868, 1869.

THE ROYAL ACADEMY OF STOCKHOLM.

The Journal of the Anthropological Institute, Vol. II, No. II.

J. Park Harrison.—On the artificial enlargement of the Ear-lobe. A. W. Franks.—Description of the Tattooed man from Burmah. R. F. St Andrews St John.—A

short Account of the Hill Tribes of North Aracan. *Commander H. S. St John*.—The Ainos: Aborigines of Yezo.

THE ANTHROPOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.

Journal of the American Oriental Society, Vol. X, No. 1.

Pitz-Edward Hall.—Thirteen unedited letters from Sir W. Jones to Sir C. Wilkins. *Rev. S. A. Rhea*.—Brief Grammar and Vocabulary of Kurdish Language of the Hakari District. *W. D. Whitney*.—Collation of a second manuscript of the Atharva-Veda-Pratīśākhya. *Rev. A. Bunker*.—On a Karen Inscription Plate.* *Rev. F. Mason*.—The Pali language from a Burmese point of view. *Rev. W. M. Thomson*.—Traces of Glacial Action on the flank of Mt. Lebanon. *Esra Abbot*.—On the Comparative Antiquity of the Sinaitic and Vatican Manuscripts of the Greek Bible.

THE AMERICAN ORIENTAL SOCIETY.

Journal of the Royal Geographical Society, Vol. 41.

G. W. Hayward.—Letters on his explorations in Gilgit and Yassin.—*Captain S. Osborn*.—The Geography of the bed of the Atlantic and Indian Oceans and Mediterranean Sea. *Major T. G. Montgomery*.—Report of the Mirza's Explorations from Cabul to Kashgar. *Capt. S. B. Miles and Werner Munzinger*.—Account of an Excursion into the Interior of Southern Arabia. *Capt. A. F. P. Harcourt*.—On the Himalayan Valleys—Kooloo, Lahoul and Spiti. *Major E. B. Staden*.—Exploration *viâ* the Irrawaddy and Bhamo to South-Western China. *Major General Abramof*.—The Principality of Karategin. *H. L. Jenkins*.—Notes on a trip across the Patkoi Range. *W. Ellis*.—Results of the Observations taken by Mr. B. B. Shaw during his journey to Yarkand in 1870.

Proceedings of the Royal Geographical Society, Vol. XVI, Nos. 3 and 4.

No. 3.—*De Crespigny*.—Northern Borneo. *Blakiston*.—Journey round the Island of Yezo. *Morgan*.—Palladius' journey through Manchuria. *Ross*.—Journey through Mekran. *Lovett*.—Survey of the Perso-Kelat Frontier. *Shaw*.—Position of Fein, Charchand Loh Nur &c. *Montgomery*.—A Havildar's Journey from Chitral to Faizabad. *Lovett*. Route from Shiraz to Bam.

No. 4.—Address at the Anniversary Meeting of the Royal Geographical Society, by Major General Sir H. C. Rawlinson, K. C. B.

Classified Catalogue of the Library of the Royal Geographical Society to December, 1870.

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

Journal of the Chemical Society, August, Sept. and Oct. 1872.

J. A. Wanklyn.—New tests for some Organic fluids. *H. Deacon*.—On Deacon's Method of obtaining Chlorine as illustrating some principles of Chemical Dynamics.

THE CHEMICAL SOCIETY OF LONDON.

Transactions of the Zoological Society of London, Vol. VIII, part 2.

Arthur Viscount Walden.—A list of the Birds known to inhabit the Island of Celebes, with an Appendix.

Catalogue of the Library of the Zoological Society.

Revised list of the Vertebrated Animals in the gardens of the Zoological Society of London, 1871.

THE ZOOLOGICAL SOCIETY OF LONDON.

* See also Proceedings for 1872, page 133.

Catalogue of Shield Reptiles in the British Museum, parts 1 and 2, by J. E. Gray.

Catalogue of the specimens of Hemiptera Heteroptera, part V, by F. Walker.

THE TRUSTEES OF THE BRITISH MUSEUM.

Memoirs of the Geological Survey of Great Britain and of the Museum of Economical Geology, London, Vols. I-IV. and June 1856-1870.

Geological Report on Londonderry and parts of Tyrone and Farnagh.

Reports on the Geology of Jamaica.

THE GEOLOGICAL SURVEY OF GREAT BRITAIN AND IRELAND.

Proceedings of the Institution of Mechanical Engineers, 1857-1869 and 1870-72.

THE INSTITUTION OF MECHANICAL ENGINEERS, BIRMINGHAM.

Les Religieuses Bouddhistes, par Mme. Mary Sumner.

THE AUTHOR.

Meghadutam, edited by Prānanāth Pandit.

THE EDITOR.

The Calcutta Journal of Science, Nos. 9 and 10.

THE EDITOR.

Grammar of the Sindhi Language by Dr. E. Trumph.

THE RT. HON'BLE THE SECRETARY OF STATE FOR INDIA.

Selections from the Records of Government, No. III.

THE GOVT. OF N. W. PROVINCES.

Anjili ya Bwana wetu na Mwokozi Isa Masiya kwa Mattayo (Gospel of St Matthew).

Katekisimo ya Kanisa Ingrezi (English Church Catechism).

Masoma ya Maandiko Matakatifu (Swaheli Scriptural Reading Lessons).

Zaburi za Daudi (Psalms of David).

Chuo cha Kuya endeleza Maneno za Kinuguja (Swaheli Spelling Book).

Sala za Subni na Jioni (Morning and Evening prayers).

Katekisimo Fupi (Short Catechisms).

Nymbo za Dini (From Ephrem Syrus).

Mashairi ya Kimasihiya.

Kitabu cha Ruth. (Book of Ruth.)

Kitabu cha Nabii Yona (Book of Prophet Jonah.)

Utenzi wa wokovu.

The First Sixteen Psalms translated into Swaheli.

Some account of the Town of Zanzibar by E. Steere.

Collections for the Nyamwezi Language by E. Steere.

Collections for a hand-book of the Shambala Language.

Collections for the Yao Language, by E. S. Steere.

Swaheli Tales, by E. Steere.

Hand-book of the Swaheli Language, by E. Steere.

THE GOVERNMENT OF INDIA.

Exchange.

The Athenæum for December 1872.

Nature, Nos. 166-168.

Purchase.

Revue Archéologique, Decr. 1872.

Comptes Rendus, Nos. 24, 25, 26.

No. 24.—*M. J. Moutier*.—Sur les effets thermiques de l'aimantation. *M. Th. Du Moncel*.—Sur les courants accidentels qui naissent au sein d'une ligne télégraphique dont un bout reste isolé dans l'air.

Nos. 25, 26.—*M. C. M. Gariel*.—Sur la distribution du Magnétisme dans les aimants. *M. Ch. V. Zenger*.—Nouvelle Note sur l'action des conducteurs disposés symétriquement autour d'un électroscope. *M. Renault*.—Sur une application nouvelle de la réduction des sels d'argent pour obtenir la reproduction de dessins.

American Journal of Science, No. 24, December, 1872.

L. M. Rutherford.—On the stability of the Collodion Film. *R. Gilgway*.—On the relation between colour and geographical distribution of Birds. *T. Leconte*.—A Theory of the formation of the great features of the Earth's surface.



PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR APRIL, 1873.

A Meeting of the Society was held on Wednesday, the 2nd instant, at 9 P. M.

The Right Rev. the Lord Bishop of Calcutta in the chair.

The minutes of the last meeting were read and confirmed.

The receipt of the following presentations was announced—

1. From the author, a copy of a printed paper entitled 'Additional Notes on the Raptorial Birds of North Western India,' by A. Anderson, Esq.
2. From the Government of India in the Home Department. A set of six photographs of Antiquities in Dinájpúr, taken by J. H. Ravenshaw, Esq., C. S.
3. From the Government of Bengal, a copy of a photograph of a pillar dug out at Bannagar in Dinájpúr, taken by J. H. Ravenshaw, Esq., C. S.
4. From the Government of India, Home Department, copies of extracts from the Proceedings of the Chief Commissioner of British Burmah on the subject of Archæological remains in that Province.
5. From the Surveyor-General of India, a copy of the General Report of the Topographical Surveys of India, 1871-72.

The following gentlemen duly proposed and seconded at the last meeting, were balloted for and elected Ordinary Members—

F. Jones, Esq., C. S.

E. White, Esq., C. S.

R. Turnbull, Esq.

Babu Umésh Chunder Dutt.

T. T. Blissett, Esq.

The following are candidates for ballot at the next meeting—

G. R. C. Williams, Esq., C. S., Muzaffarnagar, proposed by F. S. Growse, Esq., C. S., seconded by H. Blochmann, Esq., M. A.

H. B. Armstrong, Esq., Her Majesty's 1/14th Regiment, proposed by G. E. Dobson, Esq., M. A., M. B., seconded by Capt. J. Waterhouse.

W. Mackay, Esq., C. E., Port Blair, proposed by Dr. Stoliczka, seconded by V. Ball, Esq.

The Rev. John Hector, M. A., proposed by the Rev. W. Fyfe, M. A., seconded by D. Waldie, Esq.

The Rev. J. P. Ashton and Dr. C. F. Tonnerre have intimated their desire to withdraw from the Society.

Read a letter from Dr. Oldham informing the Council of the necessity he was under of resigning the office of President on account of his being obliged by ill-health to take sick-leave to Europe.

Also the following resolution passed by the Council on Dr. Oldham's resignation—

Resolved that the Council of the Asiatic Society record their sense of the obligations the Society is under to Dr. Oldham for the zeal and ability with which he has discharged the office of President as well as for his unremitting exertions to promote the objects and interest of the Society during the long period of his membership since 1851, and express their deep regret at the cause which now compels him to resign the office of President. They also earnestly hope that he may be able to return to India with renewed health and strength, and resume his place among them once more.

Colonel Thuillier on behalf of the Council begged to bring to the notice of the meeting the severe loss the Society was sustaining by the resignation of their esteemed President, Dr. Oldham. He felt certain that he was expressing the opinion of the Society at large, when he regretted the departure of their President, and more especially owing to the cause which necessitated his leaving India. He thought the Society was deeply indebted to Dr. Oldham not only for his valuable services as President of the Society, but for many years of earnest labour in the cause of Science which was brought to bear on the interests of the Asiatic Society. He wished they might see Dr. Oldham back again with renewed health and vigour, when they might again have the great benefit of his services.

The Council reported that consequent on Dr. Oldham's resignation, they had elected Col. H. Hyde, R. E., President of the Society, and Dr. S. B. Partridge a member of Council, subject to confirmation by the meeting.

The proposed elections were carried unanimously.

They also reported that they had appointed Mr. W. McLaren Smith, M. A., a member of the Library and Physical Science Committees.

The following papers were read—

I. *The History of Pegu* (continued).—By Major General SIR ARTHUR P. PHAYRE, K. C. S. I., C. B.

(Abstract.)

This paper is a continuation of the 'History of Pegu' read at the last meeting. It commences with the history of Rádzádirit's successors (end of

the fourteenth century) to Taká-rwutbi who, in 1540, was deposed by Tabeng Shwéhti, king of Táungu. The article also contains comprehensive and interesting notes on the early European travellers that visited Burnah, and an account of the dealings of the Portuguese.

II. *Studies in the grammar of Chand Bardai.*—By JOHN BEAMES, Esq., B. C. S.

(Abstract.)

Mr. Beames having published the first fasciculus of his text edition of this ancient poet, has collected in this paper the grammatical peculiarities which Chand's language exhibits. The illustrations are chiefly taken from the 1st, 19th, 64th, and 65th books.

In the preface, Mr. Beames remarks on the MSS. which he has consulted. Historically, he says, the Baidlah MS., of which the Asiatic Society has a copy, has the best right to be considered the representative of the original text. Tod's and Caulfield's MSS., belonging to the Royal Asiatic Society, were made for the officers whose names they bear in the second decade of the present century. The Bodleian has no colophon, but agrees with Tod's. The A'grah MS. is the worst, and is most carelessly written of all. As Caulfield's MS. and the Bodleian are locked up in English libraries, they cannot be used; and Mr. Beames and Dr. Hoernle take Tod's MS. as the basis of their text edition.

Mr. Blochmann said—

At the January meeting of the Society, I exhibited Arabic and Persian inscriptions from various places in Bengal, received from General Cunningham, Mr. W. L. Heeley, Mr. E. V. Westmacott, Dr. J. Wise, and Mr. Walter M. Bourke, and shewed the importance of mural evidence for the elucidation of Bengal history. I have since examined our collection of coins, in order to procure additional testimony, and have found several coins of great value. These coins are now in the hands of an artist; and a plate of such as are new, will be issued together with my paper on the inscriptions.

The coins are—

(1). Four specimens of 'Iwaz coins, as lately published by Mr. E. Thomas in his Second Part of the 'Initial Coinage of Bengal.'

(2). Three silver coins of Shihábuddin Abul Muzaffar Báyazid Sháh, of A. H. 812, and 816. Is this the Dinájpúr Rájah Ganesh (Kanis)?

(3). Three silver coins of Jaláluddin Abul Muzaffar Muhammad Sháh, of A. H. 818 and 821.

(4). One BárbakSháhi, different from the one published by Marsden.

(5). One FathSháhi, of A. H. 886—shewing the same date as Dr. Wise's inscription of that king. *Mint town, Fathábád.*

(6). Three NuçratSháhs, of A. H. 922 and 927. These coins were struck by Nuçrat Sháh during the lifetime of his father, which probably points to a successful rebellion. The mint town is K h a l í f a t á b á d, or H a v e l í, in Southern Jasar District, on the northern edge of the Sundarban, near Bágberghát. I have identified this town with the hitherto unknown *Cuipitavaz* on De Barros' Map, one of the "lost towns" of the Sundarban.

(7). One coin of Fírúz Sháh (III), son of Nuçrat Sháh, of A. H. 939.

Mint town Husainábád.

In connexion with these additions to our knowledge, I may also state that the Society has since January received the following inscriptions, which will be immediately published.

1. *From Mr. J. G. Delmerick, Delhi.*

One Balban Inscription from Sonpat, A. H. 670.

Two Ibráhím Lodí Inscriptions, from the same place, of A. H. 928, and 930.

A most interesting inscription in Sanskrit, of Samvat 1384, from Hariyana, which has been translated by Bábu Rájendralála Mitra.

2. *From Bábu Ganga Parsád, Murádábád.*

One Bábar Inscription, of A. H. 933, from Sambhal.

One Akbar Inscription, of A. H. 980, from Amrohah.

One Sháhjahán Inscription, of A. H. 1051, from Amrohah.

One Shahjahán Inscription, of A. H. 1067, from Sambhal.

3. *From Dr. J. Wise, Dháká.*

A collection of Inscriptions from Sháh Jakál's tomb at Silhaṭ. The oldest are a Yúsuf Sháhí and a Husain Sháhí; the most recent belong to Aurangzib's reign. Dr. Wise has also sent an interesting note on this legendary saint and conqueror of Silhaṭ.

Also, an inscription from 'Azimnagar, Dháká District.

4. *From Mr. Walter Mr. Bourke.*

Five inscriptions from Rájmahall.

The receipt of the following communications was announced—

1. Notes, translation and reading of a set of three copper plate inscriptions found at Sambalpur. By Bábu Pratápachandra Ghosha.

2. On the History of Pegu, No. II.—By Major General Sir A. P. Phayre, K. C. S. I., C. B.

3. Studies in the grammar of Chand Bardai—By John Beames, Esq., C.S.

4. On the genera *Murina* and *Harpyiocephalus* of Gray. By G. E. Dobson, B. A., M. B.

LIBRARY.

The following additions have been made to the Library since the Meeting held in March last.

Presentations.

* * Names of Donors in Capitals.

Monatsbericht, September and October, 1872.

Peters.—Über den *Vespertilio calcaratus*, Prinz zu Wied, und eine neue Gattung der Flederthiere, *Tylonycteris*. *Hildebrand.*—Über die Bestäubungs-verhältnisse bei den Gramineen.

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN.

Bulletin, Decembre, 1872.

Examen comparatif du tracé des routes proposées pour unir l'Europe et les Indes par le sud du Caucase.

Janvier, 1873.

Dr. Martin.—L'extrême Orient. *Clermont Ganneau.*—Découverte de la ville royale Chananfenne de Gezer.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Proceedings, 30th June and 31st July, 1872, parts 1 and 2.

Mr. R. H. Tweddell.—On the application of water pressure to shop tools and Mechanical Engineering works. *Mr. W. Proctor Baker.*—On the Buchholz process of decorating grain and making Semolina and flour by means of fluted metal rollers.

THE INSTITUTION OF MECHANICAL ENGINEERS, BIRMINGHAM.

A Manual of Diseases of the Eye, by Dr. C. Macnamara.

THE AUTHOR.

A Treatise on Asiatic Cholera, by Dr. C. Macnamara.

THE AUTHOR.

Kumara Sambhava, in Bengali rhymes, by Babu Ranga Lal Banerji.

THE AUTHOR.

Additional Notes on the Raptorial Birds of North Western India, by A. Anderson.

THE AUTHOR.

The Christian Spectator, Vol. II, Nos. 21 and 22.

THE EDITOR.

The Calcutta Journal of Medicine, Nos. 11 and 12.

THE EDITOR.

Professional Papers on Indian Engineering, Vol. II, No. 7.

H. Bell.—Graphic Time Table. *P. Dejour.*—Margohi cement. *C. Fouracres.*—Hydraulic Brake and Tumbler Shutters. *Major A. M. Lang.*—Eastern Ganges Canal. *Major H. Tulloch.*—Masonry versus Earthen Dams. *Capt. E. F. Twemlow.*—Experiments on Selenitic Mortar.

THE EDITOR.

The Rámáyana, Vol. 3, No. 5.

THE EDITOR.

The Annals of Indian Administration, 1870-71, Vol. XV. part 2, and Vol. XVI, parts 1 and 2:—

Report on the Administration of the N. W. Provinces for 1871-72.—

Annual Report on the Insane Asylums in Bengal in 1871.—

Report on the Excise Administration in the Lower Provinces for 1871-72.

Report on the Sanitary Administration of the Panjáb for 1871.

Statistics of the Crime of Dacoity.

THE GOVERNMENT OF BENGAL.

General Report on the Topographical Surveys of India for 1871-72.

THE SURVEYOR GENERAL OF INDIA.

Results of a Tour in Dárdistán, &c. Vol. I., No. III.

THE GOVERNMENT OF THE PANJÁB.

Purchase.

Pratnakanira Nandini, Vol. V, No. 8.

The Indian Antiquary, March, 1873.

Capt. J. S. F. Mackenzie.—The Kulwadi of the Hassan district. *J. Beames.*—On the Sub-Divisions of the Bráhman caste in Northern Orissa. *Professor Ramkrishna Gopal Bhandarkar.*—Patanjali's Mahabhashya. *Kashinath Trimbak Telang.*—The date of Sri Harsha. *E. Rehasek.*—An Embassy to Khatá or China, A. D. 1419. *Capt. R. Cole.*—Cromlechs in Maisur.

Exchange.

Nature, Nos. 170-74.



PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR MAY, 1873.

A meeting of the Asiatic Society of Bengal was held on Wednesday, the 7th instant, at 9 P. M.

Col. Hyde, R. E., President, in the Chair.

The minutes of the last meeting were read and confirmed.

The following presentations, received since the last meeting, were laid on the table—

1. From the Government of India, Home Department, a copy of a photograph, taken by J. H. Ravenshaw, Esq., C. S., of a pillar dug up at Bannagar in Dínájpúr.

2. From Sirdár Attar Singh Bahádur, Chief of Bhadaur, one silver and several copper coins.

Mr. Blochmann said that the copper coins were all known and published, and belonged to the reigns of Mu'izz, Balban, and Muhammad Tughluq. One was a brass token of the forced currency of the last king. The silver coin was modern, but too much was cut away to allow of a reading.

From the Government of India, Home Department, a set of 11 photographs of views of Sunnárgháon, taken by Mr. Brennand, Principal of the Dacca College.

Mr. Blochmann said that the members would be disappointed if they expected to find among the remains of Sunnárgháon large and old buildings. The ruins are few, and belong to the 14th and 15th centuries, just as the inscriptions found there belonged to the same time. Dr. Wise, in a letter to him, remarked that the people there knew nothing of the importance of this old town; not a single legend was known now-a-days. The splendour of the Nawábi period; the encroachment of the river; and the fact that towns in southern Bengal are collections of mud houses rather than what we understand by towns, go far to explain this fact. Though, like Sâtgháon, the seat of Muhammad governors and usurping kings, it is probable that neither town ever covered an extensive site.

The following gentlemen duly proposed and seconded at the last meeting were balloted for and elected Ordinary Members—

G. R. C. Williams, Esq., C. S.

H. B. Urmston, Esq., H. M.'s 1-14th Regt.

W. Mackay, Esq., C. E.

The Rev. John Hector, M. A.

The following is a candidate for ballot at the next meeting—

J. W. Johnston, Esq., M. D., 4th Regt. P. I., Abbotabad, proposed by Captain J. Waterhouse, seconded by H. Blochmann, Esq., M. A.

The Council reported that on the recommendation of the Philological Committee they will print in their *Bibliotheca Indica*, Captain Graham's English translation of *Badāonī*.

Col. Hyde exhibited electrotypes of 200 Greek coins from the British Museum.

Mr. Blochmann exhibited the following Arabic and Persian inscriptions received from members of the Society.

1. From Mr. J. G. Delmerick, Dillī, tracings of the following inscriptions from Sonpat. Mr. Blochmann reads and translates them as follows—

1. The Sonpat Mosque.—Balban's reign.

تجدد هذه العبارة المسجد المبارك الجامع في نوبة السلطان الأعظم ظل الله في
العالم غياث الدنيا والدين القائم بأمر الرحمن ابوالمظفر بلبن السلطان ناصر أمير
المؤمنين خاد الله ملكه و سلطانه العبد الضعيف مير بيگ بن احمد بيگ مقطع
سونپت في التاريخ رمضان المبارك عظم الله حرمته منه سبعين وستماية //

This building, the blessed Jāmi 'Mosque, was renewed during the reign of the great King, the shadow of God on earth, Ghiyāsuddunyā waddīn, who stands by God's order, Abul Muzaffar Balban, the King, the aider of the Commander of the Faithful—may God perpetuate his kingdom!—by the weak slave Mīr Beg, son of Ahmad Beg, the *muqfi* (Jāgīrholder) of Sonpat. Dated, the auspicious month of Ramazān (may God increase its honor!), 670.

The name of the founder is not quite certain, as the diacritical marks are wanting; it may be Mīr Lang instead of Mīr Beg; but the name of Ahmad Beg is clear. The letters of the inscription are thick and clumsy.

2. The Khwa'jah Khizr Kha'n Darga'h, of Sonpat.

مرتب شد عمارت دهلیز حظیر میاں خواجہ خضر بن دریا خان شیروانی
رحمة الله عليهما يوم الاثنين الخامس عشر من شهر شوال سنة ثمان عشرين وتسعمائة
في عهد السلطان العادل البازل الوثاق بتأييد الرحمن ابوالمظفر ابراهيم شاه بن
سکندر شاه بن بهلول سلطان خاد ملكه و سلطانه //

The portico of the tomb of Khwájah Khizr Khán, son of Daryá Khán Shirwání—may God have mercy upon both!—was erected on Monday, 15th Shawwál, 928, in the reign of the just and liberal King, who relies on the assistance of the Merciful, Abul Muza'ffar Ibráhím Sháh, son of Sikandar Sháh, son of Bahlúl, the King. May God continue his kingdom and reign!

بمعون الله تبارك و تعالی و فضله عمارت گنبد این حظیرہ بندگان میان معظم
و مکرم میان خواجه خضر مرحوم مغفور بن دریا خان بن شیخ المشایخ شیخ احمد
بن ملک المشایخ شیخ مندوکی درویش شیروانی علیهم الرحمة و الغفران مقطع
قصبہ سونپتہ در عہد حضرت سلطان السلاطین مہمد قواعد الاسلام و الدین ظل الله
فی العالمین الراقی بتائید الرحمن ابوالمظفر ابراہیم شاہ بن سکندر شاہ بن بھلول
شاہ سلطان خلد ملکہ و سلطانہ تمام شد بمقامیش لنگر خان خضر در پانزدہم ماہ
رجب رجب قدرہ سنۃ ثلثون و تسعمایۃ ۱۱

With the help of God, who is blessed and exalted, and by His grace, the building of this tomb of the great and noble saint, Miyán Khwájah Khizr Khán, the deceased, the pardoned, son of Daryá Khán, son of the Shaikh of Shaikhs Shaikh Ahmad, son of the king of Shaikhs Shaikh Mandúkí Darwísh Shírwání—may God have mercy upon them,—zamindár of the town of Sonpat'h, was completed in the time of the king of kings, the confirmer of the laws of Islám and the faith, the shadow of God in both worlds, who trusts to the aid of the Merciful, Abul Muza'ffar Ibráhím Sháh, son of Sikandar Sháh, son of Bahlúl Sháh, the King—may God perpetuate his kingdom and rule!—by order of Langar Khán Khizr, on the 15th Rajab—may the honor of this month increase,—A. H. 930.

Regarding these three inscriptions, Mr. Delmerick has the following note:

'The first inscription is of the time of Ghiyásuddín Balban and bears the date Rajab, A. H. 670, or A. D. February, 1272. There is only one other inscription of the time of this monarch extant, as far as I know, viz., that on the walls of the Jámí' Masjid at Garhmukhtesar in the Mirat District, and noticed by Thomas in his book on the Chronicles of the Pathan Kings of Delhi, page 136.

'The inscription now for the first time published, is on the walls of the Masjid of Sayyid Naqíruddín 'Abidullah at Sonpat.

'Local tradition states that Sayyid Naqíruddín 'Abidullah bin Muhammad, who was usually called Abbá Muhammad Naqir, came from Arabia via Egypt to Nishápúr, where hearing that the Rájah of Kanauj gave large prices for Turkí horses, he bought a number of such horses and resolved to take them himself to India for sale. He had sixty servants with him. On reaching Sonpat, Rajah Arjun Deo, who was the Governor of the District, prohibited the Sayyid from proceeding further, and wanted to get the horses by force. There was a fight and the Sayyid together with fifty-nine of his ^K followers suffered martyrdom. Arjun Deo himself and many other Hindus were ^{re} slain in this contest. One man alone of the Sayyid's party escaped. His ^h name was Jauhar. He was protected by, and found an asylum with, Sheo Chaid, a Brahman,

whose descendants are still residents of the town, and are the hereditary Qánúngos of the parganah.

'The date of the death of the Sayyid or horse merchant is said to be the 12th of Muharram, A. H. 287, or A. D. 19th January, 900.

'The second inscription is over the doorway of the building which covers the tomb of Khwájah Khizr Khán, and is dated the 11th Rajab, A. H. 930, or A. D. 16th May 1523. It is a beautiful edifice solidly constructed of sandstone, and in tolerably good preservation. The dome is lofty and grand.

'I have been unable to ascertain what particular office or rank this Khwájah Khizr, the son of Daryá Khán Shirwání, held at the time of his death.

'There was a celebrated chief of that period called Daryá Khán Lodí, who lived up to the time of Bábar's conquest of Hindústán; for he it was, as is commonly asserted by Muhammadan Historians, who invited Bábar to invade his master's dominions.

'Firishtah relates that "one day while the King (Sikandar Lodí) and "his court were playing at *chaugán*, the bat of Haibat Khán Shirwání* by "accident came in contact with the head of Sulaimán, the son of Daryá Khán "Lodí, who received a severe blow. This was resented on the spot by Khizr "Khán, the brother of Sulaimán, who galloping up to Haibat Khán struck "him violently on the skull. In a few minutes both sides joined in the "quarrel, and the field was in uproar and confusion. Muhammad Khán Lodí "and KhánKhánán Lodí interposing endeavoured to pacify Haibat Khán, "and succeeded in persuading him to go quietly home with them."

"The king apprehensive of conspiracy retired immediately to the "palace, but nothing more transpiring he made another party at the same "game a few days after. On the road to the playground Shams Khán, a "relative of Haibat Khán Shirwání, perceiving Khizr Khán, the brother of "Sulaimán Lodí, instantly attacked him with his bat and knocked him off "his horse. The king abused Shams Khán grossly, and returned to his palace, "and could not be persuaded but that there was some plot in agitation."

'In the above account, if we read Haibat Khán Lodí for *Shirwání*, Daryá Khán Shirwání for *Lodí*, and Sulaimán Shirwání for *Lodí*, we shall find that a Lodí struck a Shirwání, upon which the brother of the Shirwání assaulted the Lodí. The quarrel was made up for the time by other Lodís persuading their kinsman to go quietly home with them. As the narrative at present stands, if we follow Firishtah strictly to the letter, we are perplexed in think-

* In the *Kh-i-Dáúdí*, (vide page 463 of Elliot's Muhammadan Historians of India, Vol. IV) *فیر* said that the bat of Daryá Khán *Shirwání* struck Sulaimán, but this is manifestly an error, and shows that a confusion of titles and even names is not by any means uncommon with Indian writers or copyists.

ing how the Lodis could have pacified a Shirwání so soon after the quarrel, and how they should have taken him to their home, which was not the home of the offended Shirwání. I am inclined, therefore, to correct the text of Firishtah to the extent above suggested, as I believe the same to be an error. Thus I almost certainly identify Khwájah Khizr Khán Shirwání of the inscription with the Khizr Khán who took so prominent a part in the scuffle above described.

'It is also stated by Firishtah that Khizr Khán was present during the successful operations against Chanderi, which took place during the latter part of the reign of Sikandar Lodi.

Another interesting inscription received from Mr. J. G. Delmerick, is the following, from the tomb of the renowned saint Bú 'Alí Qalandar, Pánipat. Mr. Delmerick says that the building has pillars of *kasóti*, or touchstone, to which allusion is made in the inscription; but there are no other inscriptions at Pánipat.

Bú 'Alí Qalandar died at Pánipat on the 13th Ramazán, 724, or September, 1324; *vide* Proceedings, As. Society, Bengal, for April, 1870, p. 125.

Pánipat Inscription.

همچو عیسی مرده را بخشد روان	مظهر نور جلال است و جمال
خان بن خان است رزق الله خلی	از مقرب خان است اولاطون دهر
زان شرف گشته ارسطوی زمان	بوعلی چون بوعلی شبناس کرد
هرستون سنگ محک در زیر آن	تا بنا فرمود ایوان چو خلد
چون طلای کیمیا کردم عیان	از خود جستم عیار سال او
شد بوالا جاه رزق الله خان	سال تاریخ بنایش در حساب

1. This tomb is the place where the light of God's glory and perfection appears; like Jesus, it gives life to the dead.

2. Muqarrab Khán, the Plato of his age, had a son Rizqullah Khán.

3. When Bú 'Alí [the Pánipat Saint] recognized this Bú 'Alí [i. e. this great doctor], he [Rizqullah], thus honored, became the Aristotles of his age.

4. He then ordered the erection of this paradisiac portico, below which each pillar is made of touchstone.

5. I put thought to the touch, in order to discover the year of the building, when I beheld the gold of alchemy,

6. And the year of its erection appeared in the value of the letters 'the noble Rizqullah Khán' [1071, A. H., or A. D 1660].

Regarding Muqarrab Khán and his son Rizqullah Khan, *vide* my Aín translation, pp. 544, 545. Rizqullah died in the 10th year of Aurangzib's reign. The Maásir-ul-Umará states that the Dargah itself was built by Muqarrab Khán.

2. From Ganga Parshád, Esq., Deputy Collector, Murádábád, several readings of inscriptions from Sambhal, Amrohah, and Murádábád, N. W. P. The translations are by Mr. Blochmann.

1. Bá'bar's Mosque at Sambhal.

This mosque, according to Mr. Ganga Parshád, "is situated in Mahallah Kot, and faces east. It was originally a Hari Mandir, and was converted into a mosque by Bá'bar's order. At the side is a tank for ablutions, and a very old well. The mosque has still a chain for the suspension of a bell, and a passage at the back for the wheeling round of worshippers. There are many inscriptions on stone tablets in this mosque shewing the dates of erection and repairs." The oldest is the following (metre, short *Ramal*)—

جامع ابنیہ فضل و کمال • رافع الوبیہ ملک و ملل
 بامط اجماع امن و امان • بانی ابنیہ علم و عمل
 شاه جم جاہ محمد بابر • جفظ اللہ له عز و جل
 شمع دولت چو برفروخت به ہند • روشن از پرتو آن شد سنبھل
 از بیع ساختن این مسجد • کہ مصرن بار ز نقصان و خلل
 کرد فرمان بہ کمین ہند • خویشت • کہ بود عمدہ ارکان دول
 میرو با عقل و خرد ہندو بیگ • آن بہ اخلاق نکو گشت مثل
 چون ز فرمان شہنشاہ جہان • یافت اتمام بہ توفیق ازل
 سال تاریخ و مہ و روزش گشت • یکم از شہر ربیع الاول
 سنہ ۹۳۳ ہجری

1. The collector of buildings of grace and beauty, the raiser of the standards of rule and of faith,

2. The spreader of the wings of peace and tranquillity, the builder of the buildings of knowledge and deed,

3. Muhammad Bá'bar, a Jam in dignity,—may God Almighty have him in His keeping!—

4. Kindled in India the lamp of power, when a ray of it fell upon Sambhal.

5. To build this mosque—may it be protected against destruction and decay!—

6. He gave orders to his mean slave, who is one of his principal officers,

7. Mír Hindú Beg, the intelligent and wise, who is an example to others in polite manners.

8. And when in consequence of the order of the sovereign of the world, by the guidance of Providence, the mosque was completed,

9. Its date was "the first day of the month of Rab' I." (A. H. 933, or, 6th December, 1526, A. D.).

This mosque was repaired in A. H. 1067 (A. D. 1656-57) by Rustam Khán Dak'hin, as stated in the following *Tārīkh*—

کرد تزیین مسجد جامع • خان رستم خطا نیک نہاد
 سال تاریخ اسعدی بذوشت • رونق خانہ الہی داد

1. The Jámí' mosque was adorned by the excellent Khán, whose title is Rustam Khán.

2. The poet As'adí wrote down as *Tárikh* the words 'He adorned God's house.' (A. H. 1067.)

Two other tablets mention the *Tárikhs*—(1) buq'ah i faiz ; and (2) Sijdahgáhé khalq kardah.

2. The Mura'da'ba'd Mosque.

Murádábád is the old Chauplah or Chaupalah, so called from including in its boundary four villages, viz., Bhadaurá, Dindárpúrah, Mánpúr, and Dihri. Rustam Khán Dak'hini called it Murádábád in honor of Prince Murádbakhsh, Sháhjahán's son. The Jámí' mosque, on the right bank of the Rámgangá, stands on a high mound close to the bank, and has the following inscription—

نه بوده در مرادآباد مسجد • که بد بس کافرو هندو در انجا
 شه عادل شهابالدين غازي • به رستم خان عطا فرمود انرا
 بنا فرمود عالي قدر خانے • در انجا مسجدے رعنا وزيبا
 بناء دين خود را کرد محکم • به دنيا دين خود را کرد بالا
 پيچ تاريخ او هر نكته دانه • شده در بحر فکرا از طبع رعنا
 زدانايں یک زن بحر معني • برون آورد لؤلؤ مصفا
 درخشنده درے اينست بشنو • ز احوازي نه از خضرو مسيحا
 که رستم خان ز الطاف الهي • بني خانے دين کرده بالا
 سنه ۱۰۴۶ هجري

1. There was no mosque in Murádábád, where only Infidels and Hindús lived ;
2. The just king Shiháb-uddín Ghází (Sháhjahán) gave it, therefore, to Rustam Khán,
3. And ordered this excellent officer to build in the town a pretty and graceful mosque.
4. Thus he firmly established the building of his religion, and elevated, in this world, his faith.
5. Many a clover writer, in order to find a *tárikh*, dived ingeniously into the ocean of thought,
6. And one of the wise, thus diving, brought up a pure pearl.
7. The lustrous pearl is this, now listen,—it belongs to (the poet) Alhrá'í, not to the prophet Elias and the Messiah,—
8. 'Rustam Khán, by God's grace, reared the building of the house of faith.' (A. H. 1046, or 1636, A. D.)

Mr. Blochmann said :—

The builder of the mosque, Rustam Khán Dak'hini, is frequently mentioned in the histories of Sháhjahán's reign. The *Muásir ul Umará* also has a biographical note, from which I extract the following :

Rustam Khán was a Chirgiz from Mount Elburz. He was sold as a slave, and came into the possession of the Nizám ul mulk of the Dak'hini.

His master, however, promoted him, made him an Amír, and gave him the title of Muqarrab Khán. He fought with his master against Sháhjahán (3rd year of his reign). When the Nizám ul mulk imprisoned Fath Khán, (son of the renowned Malik 'Ambar) who had been Vakíl and Commander-in-Chief, Muqarrab Khán received the command of the army, and Hamíd Khán Habshí was made Vakíl. A short time after, Fath Khán was released and restored to his office. Muqarrab Khán was, therefore, deposed; and annoyed at this treatment, he fled to A'zam Khán, one of Sháhjahán's officers, for protection, and solicited an appointment of the emperor. Sháhjahán received him favorably, gave him presents and a lák'h of rupees, and appointed him a commander of Five Thousand. Sometime after, in the fifth year of his reign, the emperor gave him Sambhal as *tuyúl*, and, in the 18th year, the title of *Rustam Khán*. He then accompanied Prince Aurangzíb on his expedition against Jhujbár Singh Bundelá, and in the 10th year, he devastated, with Sayyid Khán Jahán Bárha, the country of 'Adil Sháh, and was then allowed to go again to his jágir. In the 15th year, he operated with Prince Murádbakhsh against Jagat Singh of Mau, and accompanied Dará Shikoh to Qandahár. In the 19th year, he was ordered to accompany the army to Balkh, but to stay during the winter in Rohtás; and when the emperor returned from Kashmír, Rustam Khán accompanied Prince Murádbakhsh, whose left wing he commanded. After the conquest of Balkh, the Prince did not wish to stay any longer with the army, and the emperor sent Sa'dullah Kháu to Balkh. He sent Rustam Khán to occupy Andkhúd and environs, and Rustam Khán defeated the Uzbaks in several smart engagements. When Aurangzíb, after his arrival in Balkh, left the country to Nazr Muhammad Khán, Rustam Khán returned to his jágir in India. In the 21st year, he was present at the royal feast in the (new built) palace of Sháhjahánábád. Soon after, he was sent to Kábul. In the 22nd year, on the rumour of a march of the Persians upon Qandahár, Aurangzíb was sent there, and Rustam Khán commanded the rear; but a short time after arrival before Qandahár, he was sent to Bust, where he defeated the Persians, and took eleven guns with material. Sháhjahán gave him the title of Fírúzjang, and made him, on his return, a commander of Six Thousand, with 5000 horse. In the 25th year, he was again with Aurangzíb before Qandahár, and again occupied, in the 27th year, the town of Bust, under Dará Shikoh. But not long after, the siege of Qandahár had to be raised, and Rustam Khán returned. In the 28th year, he marched with Sa'dullah against Chitor. In the following year, by Dará's order, he was sent to Kábul, from where he was recalled in the 31st year, when the war for the succession had broken out. Rustam Khán attached himself to Dará Shikoh, and commanded, with Prince Sipíhr Shikoh, the left wing in the battle of Samogar, near Ágrah, in which Aurangzíb defeated Dará. He was wounded, and died soon after of his wounds (1068).

3. The Mosque of Amrohah.

The following inscription is on the Jāmi' mosque of the old town of Amrohah. The town is rarely mentioned during the Mughul period; but its families of Sayyids were renowned, like those of Mānikpūr, Bilgrām, and Bárha. To them belonged the builder of the mosque, Sayyid Muhammad, of Amrohah, who held the post of Mīr 'Adl, or Chief Justice, in the first half of Akbar's reign; *vide* my *Āin* translation, pp. 438, 490, where his biography will be found.

The inscription is (Metre, *Mujtass*).

به عهد اکبر غازي جلال دولت و دين
مدار ملک و ملل پادشاه ظل اله
زمانه خادم درگاه اوست بے تکليف
ستاره بندد فرمان اوست بے اکراه
بنا نمود در امروه مسجد جامع
معز دين محمد امير خلق پناه
سپهر مرتبه سيد محمد عادل
که وصف او شده اوراد خلق بے گه و گاه
مگوز های اخير و بگوي تاريخش
بنای مير عدالت پناه عاليجاه

1. In the reign of Akbar, the victorious, the glory (*jaidi*) of power and religion the pivot of the kingdom and of the faith, the Pādishāh, the shadow of God,—

2. (Time, without exaggeration, is the servant of his throne; the stars, without hesitation, are his obedient servants),—

3. The Jāmi' mosque at Amrohah, was built by the ornament of Muhammad's religion, the nobleman with whom people take refuge,

4. Of exalted dignity, Sayyid Muhammad, the just, to whose praise people at all times sing homilies.

5. Leave out the final *he*, and you will find the date in the words, 'the building of the exalted Chief Justice.' (i. e. 996—16, = A. H. 980, or A. D. 1572.)

4. The Fort of Amrohah.

The following inscription belonged to the Fort of Sayyid 'Abdul Majid, *alias* Diwān, at Amrohah. The fort no longer exists; only a portion of the wall and gate is preserved.

الله اکبر

در عهد سلطان عاليشان صاحبقران ثانی شهاب الدین محمد شاهجهان پادشاه
غازي خداالله ملکه سيادت مآب مہرن ميد همدان این قلعه بنانمود
شد چو این قلعه خورمي افزا • خوب مضبوط و خاص مستکم
خواستم مالش از دبیر خرد • گفت بشمار قلعه خورم
سنه ۱۰۵۱ هجري
باعتماد بندد کمال خان خانقہ زاد شهر رمضان المبارک سنه ۱۰۵۱ هجري

996
7

God is Great !

In the time of the great king, the second Lord of Conjunction, Shiháb naddin Muhammad Sháh jahán Pádisháhi Ghází—may God perpetuate his reign !—this fort was built by the refuge of Sayyids, Mírán Sayyid Hamadán.

1. When this joy-increasing fort, beautiful, firm, and exceedingly strong, was built,

2. I took counsel with Thought and asked for a *tárikh*, when he said, "Count the letters in the 'happy fort'." (A. H. 1051).

Built by the servant Kamál Khán Khánabzáda, in the blessed month of Ramazán, 1051. (December, 1641.)

The names of the builder and the architect do not occur in the *Pádi-sháhnámah*.

Mr. J. G. Delmerick has also sent to the Society readings of the following Sanskrit Inscriptions, which have been translated by Bábu Rájendralála Mitra.

1. S'arabala Inscription, Hariya'na' District.

1. Salutation to that Gaṇádhīpati (a) by adoring whose feet mankind obtain all that they can wish.

2. May Satyala (b) with (his wives) Ambāvatī and Ambā, preserve you,—the god by whose grace worshippers become objects of happiness.

3. There is a country named Hariyāna, which is like unto a heaven on the earth, and there stands in it the city of Dhīlī built by the Tomaras.

4. After the Tomaras, the Chāhamānas, who were ardent in protecting their people, reigned in that city, whose enemies were all overcome.

5. Next the Mlechchha Sahābadīn, (c) the fire of whose vigour had consumed to ashes the forest of his enemies, took the city by his might.

6. Thenceforward up to this day it has been in the possession of the Turushkas, and now the auspicious King Muḥammad Sāhī (d) rules it.

7. Next. In that city dwelt a family of merchants of Agrotola. (e) In it was born a Sādhan, named Sava-deva.

8. His son was Lakṣmīdhara, who was like a bee on the two lotus-like feet of the lord of Lakṣmī (Vishnu). He was constant in the adoration of the gods and Brāhmanas, and was celebrated for his good-will towards all created beings.

9. He had two sons, both not of this sinful Kali ago, both like oceans of greatness; the first, by name Māhā, was of mature understanding; the younger Ghikā was of great fame.

10. Māhā had a beautiful son named Mohīś, who was always bent on worshipping the gods, Brāhmanas and seniors.

11. Ghikā married the daughter of S'ridhara, named Vīro, who was devoted to her husband. By her he had two sons.

12. The elder (of these two) was Khotala, an ocean of goodness and of polished behaviour. The younger was named Paitūka; (f) his mind was full of respect for all seniors and Brāhmanas.

13. In the minds of these two merchants, (Sādhus) Khotala and Paituka, always disposed to meritorious works, a spot of ground outside the goodly village of S'arabala appeared agreeable.

14. There, for the eternal enjoyment of heaven by their parents, and for attainment of offspring, Khetala and Paituka caused a well to be excavated.

15. This was written on Tuesday, the 5th of the waxing moon, in the month of Phālguna, in the year of the Veda, Vashu, fire and the moon (*g*) of the era of Vikramārka.

16. In the village of Sārābala in the Pratigana (*h*) of Indraprastha, may this well last for ever, as also its maker with his family !

Samvat 1334, Phālguna Sudi 5, Tuesday.

Notes.

a. Gages'a.

b. I know of no Hindu divinity of this name, and therefore suspect this to be a mislection of some other word for S'iva, the husband of Ambā.

c. This is of course the Indian Corruption or Sanskritisation of Shihāb-uddin.

d. In Sanskrit and old Hindi writings the Semitic Shāh is generally written Sāhi, with a dental sibilant and a final *i*.

e. This is either the original, or a Sanskrit form, of the name of A'grā, the merchants or baniyās of which place are well known all over India as the Agarwālā baniyās.

f. The *u* of this word is long in this place, but in the two subsequent stanzas it is short, according in the three different places to the exigencies of the metre ; what its true sound is, is not ascertainable.

g. The numerical value of the words being equal to 1334—thus ; Veda = 4, Vashu = 8, fire = 3, and moon = 1.

h. No Sanskrit Dictionary gives this word. It evidently stands here for a province or a district. Perhaps it is a mislection of *pratigata* "in front of."

स्तुति ॥ सर्वभीष्टफलं यस्य पदाराधनतत्पराः ।

लभन्ते मनुजान्तास्ते गणाधिपतये नमः ॥ १ ॥

सत्यलो नाम वः पातु साम्प्रवत्याम्बया सह ।

प्रसादादस्य देवस्य भक्ताः स्तुः शौख्यभाजनम् ॥ २ ॥

देशोक्ति हरिधानाष्टः श्रुतिर्वा स्वर्गसन्निभः ।

वित्तिकाष्टा पुरो तव तोमरैरुक्ति निर्मिता ॥ ३ ॥

तोमरानन्तरं यस्यां राज्यं निहतकण्टकं ।

चाचमाना नृपाश्चक्रुः प्रजापालनतत्पराः ॥ ४ ॥

अथ प्रतापदहनदम्भारिकुलकाननः ।

खेच्छः सदावदीनस्तां बलेनाजगृहे पुरीं ॥ ५ ॥

नतः प्रवृत्ति भक्ता सा तुष्यत्यैवावदय पूः ।

श्रीमद्वन्दशास्त्रिणां पाति सम्प्रति भूपतिः ॥ ६ ॥

अपिच ॥ तस्यां पुर्यस्ति वणिजामयोतकनिवासिनां ।

वंशः श्रीवावदेवाष्टः साधुस्तत्रोदपद्यत ॥ ७ ॥

लक्ष्मीधरस्तनयोदभव लक्ष्मीधराङ्गिद्वयपद्मभङ्गः ।
 देवद्विजाराधननिष्ठचित्तः समस्तभूतायनस्तन्त्रकीर्तिः ॥ ८ ॥
 लक्ष्मीधरस्य तनयो कलिकालबाह्यावासासुभौ महिमवारिनिधी सुकपो ।
 माहाभिधो निपुणबुद्धिरभूतदायो घीकाख्य उत्तमयशः खनुजस्तु तस्य ॥ ९ ॥
 माहाख्यस्याभवत्पुत्रो मेरुनामा मनोहरः ।
 देवद्विजगुरुणा यः सदाराधनतत्परः ॥ १० ॥
 श्रीधरस्यात्मजां वीरोनाम्नी भर्तृपरायणा ।
 घीकाखिबाह्यामास तस्यामासासुभौ सुतो ॥ ११ ॥
 ज्येष्ठस्तयोः खेतलनामधेयः साधुलपायोधिरनन्तशीलः ।
 पैतुकनामा च लघुः समस्तगुणद्विजाराधनशीलचित्तः ॥ १२ ॥
 कथैतयोः खेतलपैतुकाख्याध्वोः सदाकीर्तनकर्मबुद्धोः ।
 इयं श्रमासारबलाभिधानप्रामाण्यभूरध्यवसस्तु धिते ॥ १३ ॥
 पिष्टृणासक्त्यर्थं स्वर्गप्राप्तैः सन्तानवृद्धये ।
 खेतलः पैतुकश्चैव कारयामासतुः प्रदिष्टः ॥ १४ ॥
 वेदवसप्रिचन्द्राङ्गसङ्गोद्वे विक्रमाङ्कितः ।
 पद्धत्यां फाल्गुनसिते लिखितं भौमवासरे ॥ १५ ॥
 इन्द्रप्रस्थप्रतिगणे ग्रामे सारवलेव तु ।
 चिरं तिष्ठतु कूपेयं कारकश्च सवाञ्चवः ॥ १६ ॥
 संवत् १३८४ फाल्गुनशुद्धि ५ भौमदिने ॥

2. Inscription from Na'da'yana, near Indraprastha.

1. Prosperity ! Ho, (Ganes'a), who is known as the destroyer of every evil in behalf of those who seek his protection ; who bestows every favour to those who adore him with salutation ; who is the remover of misfortune—bears one prominent tooth like a crystal staff for the destruction of the enemies of the gods.

2. May Chaṇḍikā, who overthrows the enemies of the Lord of the Devas ; who sits on the shoulder of the buffalo giant ; who is boprised by Hari, I'sa, and the Lotus-born, for success of every kind ; who quickly bestows rewards to mankind ; who upholds the universe ; who is the protectress of my family ; may she prove destructive to the sins of this world !

3. There is a great and virtuous province named Hariyāna, where Krishna, along with Pārtha, careered for the suppression of sin.

4. Therein exists the city of Dhilli, embellished with innumerable jewels, whence sin is expelled by the recitation of the Vedns by the knowers of the Ś'rúti, and which is resonant with the music issuing from the tinkling of ankle-ornaments of charming damsels, even as the river of heaven is with the voice of geese.

5. There was born the renowned Mahammad Sāhi, the crowning jewel of all earthly lords, the vigour of whose arms had overthrown all enemies ; the institutor of a new era ; the mighty. When he proceeds on hunting excursions, through fear the earth trembles, the ocean dries up, the mountains shake, and his enemies fly to distant quarters.

6. Lineage described. There lived formerly in the village of Náḍáyana a merchant of the name of Govinda Deva and his family, all performing many virtuous acts, and were the glory (lit. standard) of the Rohitaka race.

7. Unto Govinda Deva was born a clever son named Ratna, even as a jewel is produced from the ocean. By him the auspicious and constant Gaganās'ri was taken for wife.

8. She bore unto him four renowned sons, the Ratnasādhva. These were Gangādhara, Mādhava, Lakshmana, and Dāmodara.

9. The youngest among them, Dāmodara, having married the beloved Virodā, obtained the auspicious Dhīra Deva, Krishna Deva, and other sons to the number nine.

10. Among them Dhīra Deva, the intelligent and knowing, was possessed of every accomplishment, well versed in mercantile work, in buying and selling, and an excellent judge of the qualities of cattle, land, gold, stuffs and jewelry.

11. He married a noble and auspicious lady named Dhāni. By her he had two sons, Risāḍa and Sudeva.

12. Risāḍa had two goodly sons by his wife Rājās'ri, namely, Dullabha Deva and S'rikara.

13. The intelligent S'rikara was well versed in the law, and devoted to the worship of the lotus-like feet of the lord of Sri (Viṣṇu). He had two wives of good parentage, Kalyā and Gangadis'ri.

14. By them he got three accomplished and excellent sons: Prithvidhara by the eldest virtuous lady, and S'ridhara and Solhana by the younger.

15. To the west of Indraprastha there is a village named Nāḍāyana. To the north of this village a well was caused to be excavated by S'ridhara for the gratification of his parents.

16. "Is this the water of the celestial river, cool, sweet, and wholesome? or is it nectar thrown here by the immortals?" Thus exclaims the traveller when he proceeds home after drinking the sweet clear water of this well.

17. Written by Mādana Deva in the year four, eight, fire and moon, (a) of the era of Vikrama. On Thursday the 3rd of the wane in the month of Bhādra.

Samvat 1384, on the 3rd of the wane in the month of Bhādra, Thursday. May good happen of this!

(a) Fire equal to 3, and moon equal to 1. The figures, being transposed according to the usual practice in such cases, give the date 1384.

ससि ॥ १० नः प्रणतदेहिनां निखिलविघ्नविघ्नसह-
 ब्रमञ्जनसमोदितं वितरतीह यः पूजितः ।
 प्रधारयति विघ्नपेा रदनमेकमत्युन्नतं
 प्रभेतुमिव नाकिनां स्फटिकदण्डमुग्रं दिशः ॥ १ ॥
 सुरेन्द्रिपुमर्दिनीमहिषघाटिकासंस्थिता
 हरीशकमलोद्भवैरखिलसिद्धिहेतोः सुता ।
 भवेत् सकुलदेवता भवदघोषविष्णुनये
 द्रुतं जनफलप्रदा भुवनधारिणी चण्डिका ॥ २ ॥
 हरियानकसंज्ञासि देशः पुण्यतमो महान् ।
 कृष्णः सपार्थो अचरयन् पापौघशान्तये ॥ ३ ॥
 तस्मिन्निधे निखिलरत्नचयोपगुहा
 वेदसमैः श्रुतिविदां हृतपापपुञ्जा ।

द्विज्जीपुरो सुरनदीव विभाति रम्या
 रम्याङ्गनाचरणनूपुरद्वयशब्देः ॥ ४ ॥
 तत्राभूत्तद्वयमन्दसाहिरखिलसौशीशूडामणि-
 र्विष्णुतो निजवाङ्मयीयदलितारतिः शक्रेन्द्रो बली ।
 वासाद्भुजलतीह यस्य मृगयाक्रीडावर्गो गच्छतः
 सिन्धुः शुष्यति कम्पसाशु हि दिशोयान्मृदयोपि द्विपः ॥ ५ ॥
 वंशकथनं ॥ आसीद्विष्णुवन्धुपरिष्ठितः प्राङ् नाडायणग्रामकृताधिवासः ।
 गोविन्ददेवो दक्षपुण्यकर्मदत्तोव रोक्षितकवंशकेतुः ॥ ६ ॥
 तत्पुनर्गुणवान् अञ्ज रत्नो रत्नमिवामुधेः ।
 येनाढ्य धर्मिणा पत्नी गगनाश्री पतिव्रता ॥ ७ ॥
 तस्यामजायन्त सुताः प्रसिद्धाश्चलार श्ते किल रत्नसाधोः ।
 गङ्गाधरो माधवलक्ष्मणाख्यावन्धु दासोदरनामधेयः ॥ ८ ॥
 लघुर्दामोदरलेपां विरदां प्राप्य सुप्रियां ।
 श्रीधीरदेवकृष्णादींस्तनयांस्तथैववाङ्मव ॥ ९ ॥
 तेषामभूत्सर्वकलासभिज्ञो वाणिज्यकर्मकथयविक्रयज्ञः ।
 गोभूमिहोमस्वरत्नविज्ञः श्रीधीरदेवो मतिमान् गुणज्ञः ॥ १० ॥
 तेनोद्वाह्य शुभां पत्नीं धन्यां धनीतिविश्रुतां ।
 दावङ्गजौ रोषडाण्यसुदेवौ जनिताविमौ ॥ ११ ॥
 राजप्रियां नामपद्मां रोषडाः सत्पुताविमौ ।
 लोभे दुर्लभदेवाण्यं श्रीकरं च ततः परं ॥ १२ ॥
 श्रीश्रीकरः श्रीवरपादपद्मसंसेवनज्ञो मतिमान् विधिज्ञः ।
 सद्गुणजैर्मा लभतस्त्र कान्ते कल्याभिधानीमयगंगदित्री ॥ १३ ॥
 श्रीश्रीकरस्येह कलासुदक्षाः पुत्रास्तयोमी गुणिनो वभूवुः ।
 शब्दोधरो ज्येष्ठपतिव्रतायां जातोपरौ श्रीधरसोऽङ्गणाख्यौ ॥ १४ ॥
 इन्द्रप्रस्थाद्वावणे दिग्विभागे ग्रामः स्थातोप्यस्ति नाडायणाख्यः ।
 ग्रामादस्मादिष्टुदीप्तां पिदृशां हस्तैश्च कूपः कारितः श्रीधरेण ॥ १५ ॥
 किमु सुरसरिदग्धः शीतलं मिष्टमिष्टं किमिह तदमरैर्वा क्षिप्तमवाहृतं यत् ।
 इति पथिकसमूहस्तस्य कूपस्य पीत्वा मधुरमुदकमर्च्यं प्रस्तुवन् याति गेहम् ॥ १६ ॥
 कतिर्मदनदेवस्य तुर्व्याष्टाग्रिनिशाकरे ।
 विक्रमाब्देऽसिते भाद्रे वतीयायां गुरोर्दिने ॥ १७ ॥
 संवत् १३८४ मिति भाद्रवदि २ गुरुदिने शुभं भवतु ॥

Regarding these two inscriptions, Mr. Delmerick writes as follows :—

‘By to-day's post I beg to forward for translation and publication copies of inscriptions on a couple of stone slabs now in the Delhi Museum.

‘They have been carefully transcribed by Bisashar Nath, a learned Pandit and teacher of Sanskrit in a school in the city.

‘The Nārāina stone was given to me by Lalla Omra Singh, a member of the Delhi Municipality, and by me deposited in the museum. The inscription on it is in very good preservation.

‘I cannot ascertain how the Sarban stone found its way into the museum. It has been there for several years, and the inscription on it is very much abraded and cut up, and the Pundit has had a great deal of trouble in decyphering it.

‘When these stones were originally set up, Naraina was, as you will perceive, called *Narain*, and Sarban *Sarbal*. Delhi was also *then* known as Dhilli, and not Dehli and Dilli as *now* written and pronounced.

‘The two wells to which these inscriptions relate appear to have been built by *bánias*—and members of the same family within six months of each other, and during the reign of Muhammad-bin Tughluq in the Samvat year 1384, or A. D. 1327.

‘Naráina is 7 miles S. W. of Delhi, and Sarban is 5 miles south of Delhi. The two villages are six miles apart from each other.

The following papers were read—

1. On the Genera *Murina* and *Harpyiocephalus* of Gray,—By G. E. Dobson, B. A., M. B., Staff Surgeon H. M's British Forces.

The Genus *Murina* was formed, in 1842, by Dr. J. E. Gray for the reception of *Vespertilio suillus*, Temm. which was shown to possess characters generically distinct from other species of Chiroptera, and later *Vespertilio harpia*, Pallas, was made the type of a new genus *Harpyiocephalus* by the same author.

These species remained the sole representatives of their respective genera till last year when two new species of *Murina* were added—*M. grisea*, Hutton, and *M. cyclotis*, Dobson,—and a second species of *Harpyiocephalus*, from the North-Western Himalaya was described by Dr. W. Peters under the name of *H. Huttoni*.

The genus *Harpyiocephalus* is distinguished from *Murina* according to Dr. Gray* by having the wing-membrane attached to the base of the toes while in the latter genus it extends along the toe as far as the base of the claw; also by the hairiness of the feet and interfemoral membrane, and by the possession, in adults, of a single premolar only, in the upper jaw.

I lately described a new species of *Murina*—*M. cyclotis*—which presents characters peculiar to both genera as given by Dr. Gray. It so resembles *Harpyiocephalus harpia*, Pallas, in the peculiar form of the nostrils, and the distribution, quality and even colour of the fur as to appear on a superficial examination to be an immature specimen of that species. But while thus agreeing generally with *H. harpia*, it differs in having the wing membrane attached to the base of the claws instead of to the base of the toes, and so belongs equally to both genera. This convinced me that the distinctions enumerated by Dr. Gray were not sufficient to separate these species

* Synopsis of the genera of *Vespertilionidæ* and *Noctilionidæ*; Ann. and Mag. Nat. Hist. 1866, p. 66.

into different genera, and as the name '*Murina*' had the priority of *Harpyiocephalus* I placed the new species in the former genus.

I was obliged to defer publishing these remarks till I should have had an opportunity of examining skeletons of both species. Meanwhile I received Dr. Peters's paper with descriptions of two of the species referred to above in which he adds that it is scarcely possible any longer to maintain *Harpyiocephalus* and *Murina* as distinct genera; he does not, however, unite them, probably for the same reason.

An examination of the skeletons of *Murina cyclotis*, and *Harpyiocephalus harpia* has confirmed the opinion previously formed of their affinity. The chief differences are to be found in the skulls, the remaining parts of the skeletons of both species corresponding in all respects.

Compared with *M. cyclotis*, the skull of *H. harpia* is much shortened in front of the anterior origin of the zygoma, the distance between the infra-orbital foramen and the inner incisor being the same in both skulls, though their respective lengths are as 10 : 12. This shortness of the muzzle in *H. harpia* diminishes the length of the tooth-row and leaves no room for the third molar which is constantly absent in adult animals, probably pushed out by the growth of the other teeth. These might be regarded as important differences, were it not that two authors have mentioned the presence of an additional tooth in the young animal, and in Dr. Peters's description of *H. Huttonii*, a third molar is referred to.

The mandible of *H. harpia* is also, correspondingly shortened, and the teeth are crowded between the canine and the anterior edge of the coronoid process; the third molar is much smaller than the second, and being placed on the commencement of the ascending ramus is elevated by its longest cusp above the others.

The teeth in *M. cyclotis* are very similar to those in *H. harpia*, both upper premolars are large and bear about the same proportion to the canines and molars as they do in that species, agreeing in this respect with *M. grisea*, lately described by Dr. Peters,* but differing remarkably from *M. suillus* in which the first upper premolar is much smaller than the second which equals the canine in vertical extent.

In *H. harpia*, the skull is proportionately more swollen and elevated between the centres of the zygomatic arches than in *M. cyclotis*, and the sagittal crest much more developed; the bases of the skulls are very similar, the only difference observable being the greater backward prolongation of the palate bones behind the molar teeth in *H. harpia*, but this is perhaps more apparent than real as the absence of the third molar adds to the length.

* Monatsber. Berlin Akad, April 1872, p. 268.

The mandibles in both species have a striking generic resemblance in the elevation of the coronoid process above the condyle. In *H. harpia* the coronoid process is probably more developed than in any other species of bat, and its outer surface is deeply hollowed out for the insertion of muscles. Its shape is very similar to that of the common Dog, but proportionately to the length of the jaw it is much more developed. Corresponding to this great development of the coronoid process of the mandible, the teeth are very stout and thickly coated with enamel; the cusps of the molar are short and blunt and the canines much thickened, the small incisors even presenting the same peculiarity.

In *M. cyclotis*, the coronoid process is considerably elevated above the condyle, and its external surface is deeply hollowed, but its general form is triangular, not rounded as in the former species. The molars are stout and their cusps not so acute as in other species of *Vespertilionidæ*, resembling most those of *H. harpia*.

The peculiar form of the teeth of *H. harpia* is evidently connected with the nature of the food of the animal. The stout bluntly pointed teeth, well coated with enamel, are admirably adapted to crush the hard cases of coleoptera, especially of the larger kinds which a bat of the size of this species might be expected to capture. In the stomach of one examined by me the crushed cases of some species of these insects were found in abundance.

As we become better acquainted with the habits of these animals, it will probably be found that the food of this species is restricted to certain species of coleoptera possessing extremely hard cases which would effectually resist the feebler though more acutely pointed teeth of other bats inhabiting the same localities.

The form of the teeth, the great development of the coronoid process and shortness of the mandible, are all evidently subservient to the same object, and have become modified simultaneously to suit the food of the animal.

The teeth of the Asiatic and African Elephants differ much more remarkably than do the teeth of some species of bats belonging to very distinct families, and yet few zoologists venture to place them in different genera.

Professor Flower has well remarked that there is "too much importance attached to the characters of the teeth, their modifications depending on adaptation mainly, and not essentially indicative of affinity."*

The conjoined genera, united under the common name *Murina*, contain five species, enumerated above, of which *M. harpia* and *M. suillus* are most widely separated. These form a very natural group, readily distinguished from all other genera of *Vespertilionidæ* by the peculiarly shaped projecting nostrils taken in connection with the dental formulæ.

* Proc. Zool. Soc. Lond. 1869, p. 5.

Note.—In a short paper, containing notes on some species of *Chiroptera* collected by Mr. Theobald in Burma, published by me in the 'Proceedings' for August, 1872, I mentioned that I had obtained specimens of *Cynonycteris amplexicaudatus*, Geoff. from North-Western India.

I have since learned from Mr. W. T. Blanford, who sent me these specimens, that I have given a wrong locality for them, as they were taken by him in the Nemakdun Salt Caves, Kishnu Island, in the Persian Gulf.

The mistake in the locality, referred to above, was due to the label sent by Mr. Blanford having been misplaced after the receipt of the specimens.

In the Proceedings for December last I described a new species of *Vespertilio*, collected by Captain W. G. Murray in Kashmir, under the name of *V. macropus*. I discovered since, quite accidentally (as there is no copy of the "Mammals of Australia" in Calcutta,) that this name had been used for an Australian bat by Mr. Gould and consequently cannot be again employed. I propose, therefore, for this new species the name *Vespertilio longipes*.

2. On the Asiatic species of *Molossi*.—By G. E. DOBSON, B. A., M. B.

(Abstract.)

The paper commences with an account of the distribution of the species of this very remarkable and well defined group. The *Molossi* are divided into five genera, of which two only, *Nyctinomus* and *Chiromeles*, are found in the continent of Asia and its islands. By far the greater number of species belong to the genus *Molossus*, and are confined to the Western Hemisphere.

Two new species of *Nyctinomus* are described, one from Bengal and the Panjáb, *N. tragatus*, and one from China, *N. insignis*. The former resembles *N. plicatus*, Buch. Ham. very closely in size and in general aspect, but differs in possessing a much larger tragus, in the development of the ears, and in the place of attachment of the wing membrane; the latter, a large species, had been named by Mr. Blyth in his Catalogue of the Mammals in the Museum of the Asiatic Society, but not described.

The number of Asiatic species of *Molossi* described prior to 1873 were three, one *Chiromeles* and two *Nyctinomi*, and to these three more are added, making six the total number now known.

The paper will appear in the Journal.

3. On *Rhopalorhynchus Kröyeri*, a new genus and species of *Pycnogonida*.—By J. WOOD-MASON, ESQ.

The paper will appear in Journal Part II, No. 3, 1873.

4. Note regarding certain type specimens of *Batrachia* in the Asiatic Society's Museum.—By W. THEOBALD, ESQ.

The passage I wish to draw attention to in a paper of Dr. J. Anderson in the P. Z. S. of London for February, 1871, is the following: "It will be

observed that a number of Mr. Blyth's types of *Batrachia* in the Indian Museum have been identified. These are of peculiar interest, as Mr. Theobald was under the impression, when he drew up his Catalogue of the Reptiles in the Asiatic Society's Museum, that they had disappeared from the collection." On first being informed of this fact some time last year, I received the intimation with pleasure, thinking that I had been guilty of an oversight in the haste with which the Catalogue was compiled, but having recently had my attention re-drawn to the subject by Dr. J. E. Gray's repeated attacks on me, as regards the *Testudinata*, a full reply to which I am now preparing, I thought I would look into the "how and why" I came to overlook the above types, and the following is the result at which I have arrived, that whilst bearing full testimony to the patient research of Dr. Anderson, and the perfect fairness wherewith his remarks are written, I cannot but see there are some difficulties in the way of accepting his conclusion.

The first Batrachian type I was supposed to have overlooked, *Megalophrys gigas*, Blyth 71, is thus entered in Dr. Anderson's paper, and I cannot see how it is possible that Dr. Anderson can be right, but the facts are these.

"*RANA LIEBIGII*, Günther.

Megalophrys gigas, Blyth, Jour. As. Soc. Beng. XX p. 410, XIII p. 299, and XXIV p. 717.

Rana Liebigii, Gth. p. 38, 1860 p. 157 pt. 28, fig. A.

Hylorana erythræa, Schlegel, Theobald Cat. Rep. As. Soc. Museum p. 84 (J. A. S. XIII *supra* is a typographical error for XXIII)."

Now the object I had in view in preparing the Catalogue was quite distinct from the far more laborious one subsequently carried out by Dr. Anderson, namely, a critical examination of each individual specimen, and was mainly to record the number and names of specimens in the As. Soc. Museum at the time, as they stood recorded, recently in Mr. Blyth's own handwriting, on the labels attached to the bottles. As Mr. Blyth had described two species of *Megalophrys*, as among presentations to the Museum, I entered both species with references in the Catalogue, but as I could discover no specimens of the genus in the Museum, nor any specimens having that name on their label, I presumed that they had been lost. Doubtless what did take place, with respect to the species claimed as re-discovered by Dr. Anderson, was that Mr. Blyth, being satisfied it was no *Megalophrys*, removed the label. There is, however, a difficulty in accepting Dr. Anderson's identification which has not been explained or alluded to. As a matter of fact, the specimen which Dr. Anderson considers he has identified as the type of *Megalophrys Gigas*, was presented by Capt. W. S. Sherwill from Sikkim, and was an adult male; whilst the specimen identified as the above type under *Hylorana erythræa* in my Catalogue was labelled in Blyth's handwriting as presented by Major Berdmore from Mergui, and is moreover a

large female ! a fact corroborated by Dr. Anderson in re-examining the specimen. As stated by me the specimen was really labelled by Blyth *nigrovittatus*, which I have ranked as a synonym of *ERTHRÆUS*, and was the type of that species.

The next species to which I would advert is *Diplopelma Berdmorei*, Blyth, which Dr. Anderson charges me with confounding with *D. pulchrum*, Gth. Now *Dip. Berdmorei* is one of the commonest and best marked frogs in Pegu, and I am perfectly familiar with it ; yet Dr. Anderson had full warrant for what he said, for by a ridiculous typographical blunder *Dip. Berdmorei* is printed in italics, as though a synonym of the preceding species, the name of which, being an Indian frog is entered by me according to my plan, though no specimens were in the Museum. Though Dr. Anderson was really mistaken in this matter, he was fully justified in what he said so far, but I am not convinced that his recognition of the types said to be missing is correct. *Dip. Berdmorei* is subject to very little variation in colour or size, and it is more likely than not, that among four specimens from any part of Burmah he could find one which "accurately agrees with Blyth's measurements." As a matter of fact, however, the 4 bleached specimens catalogued by me, were labelled as presented by Col. Phayre from Arakan, whilst the type of "*Engystoma Berdmorei*, J. A. S. XXIV p. 720, was presented by Capt. Berdmore from Schwe Gyen. I cannot therefore hold that the authority of an original label can be superseded on the grounds of an accidental agreement or measurement in a frog subject to such slight variation as that in question. I am not aware if I am supposed to have overlooked any other types than the above, which it appears in the last degree questionable if I really did overlook, but I merely bring forward the subject in order that so curious an error of so accurate an observer as Dr. Anderson should not be perpetuated, to the bewilderment of whoever may hereafter desire to examine Mr. Blyth's types.

Dr. Stoliczka regretted that Dr. Anderson was not present to explain the mistake complained of by Mr. Theobald. He said that though he had in this case little doubt about the correctness of Dr. Anderson's specific identifications, still a mistake about Blyth's typical specimens might have occurred, unless specimens from different localities, but belonging to the same species, had been put together in the same bottle with the type specimens. In such cases one could really do no more than select that specimen as the type, which precisely agreed with the original description.

5. *A Contribution towards a Monograph of the Passalidæ*.—By DR. F. STOLICZKA.

(Abstract.)

The author said that his object in examining the Indian representatives of this family was chiefly to test the views expressed by Dr. Kaup

regarding their classification in a recent Monograph of the *Passalidæ*. The present communication is only preliminary to a more extensive monograph, but the author thought it desirable to put on record the results which he had at present obtained, because he was shortly to proceed with the expedition to Central Asia, which might last for nearly two years.

There are 29 species enumerated in the paper. Regarding several of the known ones, notes on distribution, etc., are given, and eight species are described as new. All the species which are known to occur in India, including Ceylon and Burina and the country extending southward to Singapore, have been noticed. The arrangement of the groups and genera adopted by Kaup in his recent monograph has been followed. The paper will be published in the third number of the Journal.

The author did not claim to be a supporter of the views of the philosophical school of naturalists, but he spoke in a few general terms on the principles of classification, adopted by Dr. Kaup, a classification of which Dr. Kaup may almost be called the originator, and of which he certainly is the most important representative and the greatest supporter. The principle which the philosophical school, as represented by Kaup, adopts, is briefly the following. The naturalists say that we have to arrange our zoological specimens according to three heads—first, according to the anatomical system; secondly, according to the organ of sense; thirdly, according to the different parts of the body; these being the three chief constituents which make the animal what it is. Arranging the different components of each of these according to their value we obtain the following table.

	<i>A. Anat. system.</i>	<i>B. Sense.</i>	<i>C. Part of body.</i>
I.	nervous	eye	head.
II.	respiratory	ear	chest.
III.	osseous	nose	rump.
IV.	muscular	tongue	belly.
V.	dermal	sex	sacral region.

Now, to give an example—the class of animals in which the nervous system, the eye and the head, in proportion to the body, become most highly developed is undoubtedly the *Mammalia*. In the same way we get for number II. the *birds*, as the type of respiration-animals, the third the *Reptiles* (with the *Amphibians*), including the most voluminous forms, the fourth the *Fishes* with the belly most developed, and the fifth the *Mollusca*. These five classes are regarded as the members of the first sub-kingdom. The addition of the *Mollusca* to the other four does not look a very fortunate one, and it would be perhaps more appropriate to separate the *Amphibians* from the true *Reptilians*, as they are in reality two entirely different classes. Again it does look very strange that in the fifth division the sexual system is entered as corresponding to the eye and ear, and it is not apparent why

the sacral region should be the most developed part of the body in the Mollusca.

The general plan exhibited in the above table is, however, followed by Dr. Kaup through all the five sub-kingdoms. Thus, he places—and I think rightly—the *Psittacidæ*, as the most highly organised of birds, in the first family of the five tribes into which the birds are divided. On the same principle the *Brevipennes* with the *Dinornidæ* form the centre of the third tribe, and the *Gallinaceæ*, which are the most stupid birds, take the lowest position. Among Reptilians the *Chameleontidæ* are the highest, and the *Dinosaurii* the largest; the former belonging to the first, the latter to the third tribe.

The above table is thus applied to every group, and is carried into the greatest detail in the *Passalidæ*. The largest known form, *Proculus Goryi*, is considered as the centre of the family, which is separated into *Aulacocyclina*, *Eriocnemina*, *Proculina*, *Neleina*, *Passalina*. Dr. Kaup complains, that naturalists very often mistake analogies for affinities. Nature, he says, does not like affinities, but dissimilarities, and consequently in a natural arrangement not the species following each other, but always the next following is affined to the preceding. Each genus of the *Passalidæ* is thus divided into five species, of which the first is small and most convex, the second smallest and most depressed, the third the largest, the fourth smaller and the fifth the next largest. This system is carried out in a really most wonderful way, and the exceptions to it are apparently very few. Only in one instance, in the genus *Basilianus*, has the author described seven species, but these form two different groups, which are, however, by Kaup himself regarded as belonging to the same genus. In *Leptaulax* one species is added, but another which Dr. Kaup adopts, is believed to be merely a synonym. This new law of development, or whatever it may be called, is believed by its originator to be the greatest discovery which systematic zoology has made. We must leave it to time and research, which will no doubt tell us the real value of this practical philosophic idea. In the present instance the author thought it only desirable to bring the rudiments of the system, as stated by Dr. Kaup, before the members of the Society, and expressed a hope that somebody would give a little thought to it.

Speaking of recent suggestions, Dr. Stoliezka thought he might allude to one affecting the system of nomenclature in Zoology. All these suggestions, whether they become generally acknowledged or not, shew the direction in which the working zoological minds of men are at present occupied.

Professor Harting in Utrecht has recently drawn the attention of zoologists to the unsatisfactory conditions under which zoological nomenclature labours. The number of names is becoming so varied and so alarmingly large, that no human mind can remember these heterogeneous appellations.

A more rational nomenclature is, therefore, desirable, as an aid to the memory. This, Harting says, should be so constructed that any naturalist from hearing the name pronounced should immediately know to which group a certain animal belongs. His suggestion is to the effect that all the higher divisions should terminate in *res*. Now, for each of the five principal divisions of the animal kingdom, he takes one of the vowels, a, e, i, o, u, and thus we shall have—

I. <i>Vertebrata</i>	=	Ares	=	<i>Spondylozoa</i> .
II. <i>Articulata</i>	=	Eres	=	<i>Arthrozoa</i> .
III. <i>Mollusca</i> (or <i>Saccata</i>)	=	Ires	=	<i>Malacozoa</i> .
IV. <i>Radiata</i>	=	Ores	=	<i>Actinozoa</i> .
V. <i>Coelenterata</i>	=	Ures	=	<i>Amorphozoa</i> .

Taking No. I, as an example, he proposes to prefix the term *ares* with different consonants, in order to form names for the sub-divisions, thus—

<i>Mammalia</i>	=	Pares.
<i>Aves</i>	=	Cares.
<i>Reptilia</i>	=	Fares.
<i>Pisces</i>	=	Sares.

Retaining the *Pares* as a further example, Harting proceeds further to divide them thus:

<i>Placentalia</i>	=	Plaros.
<i>Didelphia</i>	=	Praros.
<i>Erpetodelphia</i>	=	Psaros.

Then the *Placentalia* or *Plares* are sub-divided:

<i>Bimana</i> or <i>Hominidæ</i>	=	Amplares.
<i>Quadrumana</i>	=	Aoplares.
<i>Chiroptera</i>	=	Atchphares.
<i>Carnivora</i>	=	Asplares.
<i>Rodentia</i>	=	Arplaros.

As a further example of the system proposed, the *Arplares* or *Rodentia* are taken, and divided thus into:

<i>Sciurina</i>	=	Larplares.
<i>Castorina</i>	=	Carplares.
<i>Arvicolina</i>	=	Sarplares.

etc.

Then the *Sciurina* or *Larplares* are divided into a certain number of genera for which the termination *a*, as indicating a mammal should be adopted (*e*, in case of birds, etc). Thus we get:

<i>Sciurus</i>	=	Sciularpla.
<i>Pteromys</i>	=	Pterolarpla.
<i>Spermophilus</i>	=	Spermolarpla.
<i>Arctomys</i>	=	Arctolarpla.
<i>Tamias</i>	=	Tamolarpla.
<i>Myonius</i>	=	Myolarpla.

No generic name should exceed five syllables.

This system would of course answer admirably if we could calculate mathematically the number of existing genera and species, or if our science were concluded and not undergoing a constant change; but as these conditions do not obtain, it is not likely that the system will find many supporters. Still the suggestion has thrown been out, and discussion on the subject has been invited, because it is a very important one, and because the want of regulating our nomenclature in some way or other is generally felt.

Mr. Phear did not pretend fully to apprehend Kaup's system, but he would ask Dr. Stoliczka, whether the method of separating species by reference to THREE cardinal characteristics each taken out of a set of five, did not of itself immediately lead to the grouping of species also in sets of five. Each single set of five species might of course be defined as constituting a genus; or a definition of genus might be made in reference to the same characters such as would lead to the like result. But he confessed that he could not understand how in any other than some such way as this, any principle of arrangement deserving to be called a natural principle could bring about such very artificial looking classes, as Dr. Stoliczka mentioned.

In reply to Mr. Phear's observation Dr. Stoliczka stated that the number *five* selected by Dr. Kaup is, according to him, by no means arbitrary. It is dictated by the five anatomical systems, etc.. Any other larger or smaller number would of course not suit the theory. The classificatory number *five* is an old one, chiefly introduced by Oken, and Swainson used it in Ornithology. As regards the second point, Kaup's answer is decided. He says, for instance, that anybody who has thoroughly understood his reasoning, will see that a larger form of *PASSALIDÆ* than *Proculus Joryi* cannot exist. In the same way he states that a sixth species in the same genus cannot exist, if it be really a good species, and not a variety of either of the other five. Should anybody find a sixth species in one genus, and should there be no mistake in the generic definition itself, the system would of course be invalidated. Kaup says that he would be the first to give it up, if really convinced of the fact. The system itself, of course, requires improvements, probably alterations in the minor arrangement, which may be suggested by the discovery of new species. There can be no doubt, Dr. Stoliczka said, that Kaup's definitions of the genera and species are on the whole wonderfully correct. It is very difficult to find a single mistake, and if anybody come to the conclusion that he has discovered one, he will do well to revise his materials repeatedly, before he puts forth his statement as final. Dr. Stoliczka said he was speaking from experience in throwing out this suggestion.

Mr. Blanford said that from Dr. Stoliczka's account of Dr. Kaup's theory, it appeared to him to be a retrograde attempt. "The great value of Darwin's theory is, that it had rendered Natural History a Science of causes

and effects, and had taught modern naturalists to regard classification as true only when it is based upon those affinities which result from community of evolution. A true classification therefore on this view is to be regarded as the final result of the science, and is to be patiently worked out by studying the causes that have determined it. Dr. Kaup's system sweeps away all this, and seeks to impose in its stead, an arbitrary Procrustean plan of creation, fanciful and mystical to the last degree. It is allowable and even beneficial in the early days of a Science to adopt an artificial classification of objects, since any arrangement is better than none. But to seek to impose such a system on the Zoology of the present day, and to sort and manipulate species and genera to make them succumb to an *a priori* hypothesis, appears to be an attempt to set up as a leading principle of science the maxim "*Si les faits ne s'accordent pas avec ma théorie, tant pis pour les faits.*"

Dr. Stoliczka, in reply, expressed his astonishment at Mr. Blanford's unjustifiable remarks. He said that that was not the way to treat mental productions. Dr. Kaup was an old naturalist of very high standing, and his system, as proposed, was by no means a fanciful one; it was based upon those characters of organisation which make the animal what it is—and that was no fancy. Philosophic systems had from time immemorial occupied the greatest minds, and not fancies. Dr. Kaup had not only not thrown out a suggestion of a fanciful arrangement, but he had given his system a definite form, he had established rules, he considered that he had found the law according to which nature works in development, and that only according to this could the animals exist. He had given a fair test to his system in working out one group of animals in the most minutely detailed manner, and he asked the scientific world for an opinion, whether he had succeeded in this or not; he wished to be disproved, if wrong. Now, how unfair it would be, if all this mental work were to be rejected with phrases. We required first of all *facts*, not *words* or *ideas*. Dr. Kaup's definitions of genera and species were not made up in the first instance according to a fanciful scheme, they were drawn from the animals themselves. Careful *observations* and *facts* were the ground on which we must in the first instance meet Kaup. Philosophic treatment of the facts must follow, in order to so meet the genial naturalist.

Dr. Stoliczka said he had taken up the study of the *Passalidæ*, because he wished to test Kaup's conclusions on his own materials, and because he thought it *a priori* almost impossible that a really natural classification would be obtainable in the way suggested by Kaup. After devoting some time to this subject—certainly only with scanty materials—he must express his grave doubts as to the validity of the system in the form at present proposed by Kaup; but he would be sorry to have spoken, if he had said that the system was really invalidated by his researches. He was not prepared to say that.

Such an elaborate system as this had full claim to be heard on the *audi alteram partem* principle ; we must not presume that it was wrong, because it was so very simple. People very often overlook things nearest them. Hasty conclusions would, in this instance particularly, be absolutely of no value at all.

6. *Notes on some Andamanese and Nicobarese Reptiles.*—

By DR. F. STOLICZKA.

(Abstract.)

After a few general remarks relating to the distribution of certain Reptiles on these islands, the author gives a detailed description of *Phelsuma Andamanense*, of a new *Gymnodactylus* from Preparis Island, of a new *Mococa* from South Andaman, and of a new *Tiaris* from the island of Tillangchang. He exhibited a male and female of the remarkable little snake *Typhloscincus Nicobaricus* which is shewn to be a *Dibamus*, the males of which have hind-limbs while the females have none, thus confirming an opinion, which was some time ago put forth by Prof. Schlegel.

Mr. G. E. Dobson exhibited and presented to the Society's album photographs of a mosque at Tribeni near Hughli taken by him in December last.

The place was described by Mr. D. Money in the XVIth Vol. of the Society's Journal, and its Muhamnadan antiquities by Mr. Blochmann in the XXXIXth Vol. part I, p. 280, for 1870.

Also the following photographs of the aboriginal inhabitants of the Southern Andaman Island, taken by him, with Mr. T. R. Lewis's assistance, when at Port Blair last year.

No. 1. A photograph of the Chief of one of the tribes in the vicinity of Port Blair and his wife, with necklace of finger and toe bones of her ancestors.

No. 2. Photograph of the same individuals standing.

No. 3. Photograph of a woman from Rutland Island.

No. 4. Group of five young Andamanese women.

No. 5. Group of Andamanese men and women. Widow in centre with skull of her deceased husband.

The receipt of the following communications was announced—

1. Notes and translation of General Cunningham's inscriptions from Behar.—By Bábu Pratápa Chandra Ghosha.

2. Metrical Translations from Chand.—By F. S. Growse, Esq., M. A.

3. Note on the genus *Gymnops*.—By W. T. Blanford, F. G. S., C. M. Z. S.

4. On *Aquila bifasciata* and *Aquila orientalis*.—By W. E. Brooks, Esq. C. E.

5. Algæ collected by Mr. Kurz in Burma and Arrakan, determined by Dr. Zeller, High Councillor of Finance in Stuttgart.

6. Descriptions of two new species of Indian land-shells.—By Dr. F. Stoliczka.

LIBRARY.

The following additions have been made to the Library since the Meeting held in March last.

Presentations.

* * * Names of Donors in Capitals.

Bulletin, Fevrier, 1873.

L'Abbé Desgodins.—Mots principaux des langues de certaines tribus qui habitent les bords du Lan-tsang kiang, du Lon-tzo-kiang, et de l'Irrawaddy. *Francis Garnier.*—Navigation du Yang-tse-kiang. *Legrand de la Liraye.*—Expédition du Bounnyne. *Delaporte.*—Le Tong-King. La Chaîne des Garos. Les Louchais. Lettre du Japon. Explorations Russes dans l'Asie Centrale.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Instructions for testing Telegraph Lines and technical arrangements in office, by L. Schwendler, Part II, Section I.

THE AUTHOR.

Pratna Kamra Nandini, Vol. V, Nos IX-XII.

THE EDITOR.

The Calcutta Journal of Medicine, Vol. VI, Nos. 1-2.

THE EDITOR.

The Christian Spectator, Vol. VI, No. 26.

THE EDITOR.

The Flora Sylvatica, Parts XV and XVI.

THE GOVERNMENT OF INDIA.

Report of the Charitable Dispensaries under the Government of Bengal for 1871.

Report on the Administration of the Income Tax in 1871-72.

The Proverbs of the inhabitants of the Chittagong Hill Tracts, by Capt. T. H. Lewin.

THE GOVERNMENT OF BENGAL.

General Report on the Revenue Survey operations of the Upper and Lower Provinces for 1871-72.

THE SUPERINTENDENTS OF THE REVENUE SURVEY.

Palæontologia Indica, Cretaceous Fauna of Southern India, Vol. IV. p. 3. *P. Stoliczka.*—The Eobinodermata.

THE SUPERINTENDENT OF THE GEOLOGICAL SURVEY OF INDIA.

Shaháb Sáqeb, by Maulavi Zil-lul-Karim.

HABIBAR RAHMA'N.

Exchange.

Nature, Nos. 174-178.

Purchase.

The Indian Antiquary, Part XVI.

G. H. Damant.—On the dialect of the Palis. Dr. Buhler.—Abhinanda the Gauda.
Rev. M. Phillips.—The Seven Pagodas. Capt. J. S. F. Mackenzie.—On the rules which
govern Kanarese Poetry. P. M. Purnaiya.—The Calendar of Tipu Sultan. Service
Tenures in Ceylon. Archæology of Maisur.

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR JUNE, 1873.

The Monthly General Meeting of the Society was held on Wednesday, the 4th instant, at 9 P. M.

Col. H. Hyde, R. E., President, in the Chair.

The minutes of the last meeting were read and confirmed.

The receipt of the following presentations was announced—

From the Trustees, Indian Museum, a set of the Minutes of the Trustees, Vols. I to V.

The following gentleman, duly proposed and seconded at the last meeting, was balloted for and elected an Ordinary Member—

J. W. Johnston, Esq., M. D., 4th P. I.

The following are candidates for ballot at the next meeting—

H. M. Durand, Esq., C. S., proposed by J. Wood-Mason, Esq., seconded by J. H. Rivett-Carnac, Esq., C. S.

Captain Fraser, 3rd Madras Cavalry, proposed by W. McLaren Smith, Esq., M. A., seconded by Captain J. Waterhouse.

C. V. Marshall, Esq., Berhampore, Moorsshedabad, proposed by J. Wood-Mason, Esq., seconded by Captain J. Waterhouse.

Col. G. H. Saxton has intimated his desire to withdraw from the Society after the third quarter of the current year.

The President announced that Dr. Stoliczka having resigned the posts of Natural History Secretary and Member of Council on proceeding with the mission to Kashgar, the Council have appointed J. Wood-Mason, Esq., Natural History Secretary, and elected J. Westland, Esq., C. S., a Member of the Council, in place of Dr. Stoliczka.

The Secretary read the following extract of a letter from J. Beames, Esq., C. S.

"As some misapprehension seems to exist as to the nature of the task now being carried on in respect to Chand's poem, I beg to state as follows :

"I have undertaken merely to supervise the production of a printed text of Chand from a good and complete MS. I do not undertake to correct what seem to be errors in the MS., because when more is known about the poem, it may turn out that what we now think errors, are really correct.

"The object of the Society, I take it, is merely to put into the hands of scholars the poem itself as it stands. It is not now accessible to the public at large, because it is only in MS., but when it is in print, hundreds of scholars in various places can work at it, and their labours will, I hope, result eventually in a correct text. Many hundred years have elapsed since the text of Homer and Virgil were first put into print, yet scholars have not yet left off altering and improving the text. I think it would be almost dishonest in me to tamper with the text of the MS., by so doing I should perhaps mislead all future generations of scholars by giving currency to what my own imperfect knowledge deems right, instead of what the poet really wrote.

"The two points open to discussion at present are the division of the words and the metres.

"On the first of these points I would only say that the division I have made is not intended to be an *ex-cathedra* declaration that I am right. It is merely a suggestion. In a large majority of cases there can be no doubt, in doubtful passages future scholars are at liberty to alter as they please. The question will probably be a debatable one for centuries to come.

"As to the metres, I could easily by doubling single letters, reducing double letters to single, and otherwise hocussing the text, bring the metres into accordance with the modern rules of Hindi prosody. But this I will not do, it is not fair. I put before the world the exact spelling of my MS., and scholars can manipulate it as they like. What the world wants, is not Prithiraja Raso by Beames, but Prithiraja Raso by Chand.

"Having thus clearly stated my 'platform,' I beg to retire from the controversy for which I have neither time nor taste. If critics like to pull the text to pieces, they can, it matters nothing to me. It is not I who wrote the poem, but Chand, I am a mere printer's devil putting what Chand wrote into type, and if scholars find fault with Chand, they may cudgel him to their heart's content, it is no affair of mine."

Also a letter from the Secretary to the Government of India, Foreign Department, conveying the thanks of the Viceroy and Governor-General in Council to the Society for their offer of cordial co-operation and assistance in furthering the Scientific objects of the Yarkand Mission, and stating that

H. E. in Council would be glad to be favoured with any further observations which might occur to the Council of the Society, as to the specific points to which the attention of the officers attached to the Mission should be directed.

In compliance with this request, the following memorandum has been drawn up by the Natural History and Physical Science Committees, and submitted to Government.

Memorandum of Subjects for Scientific Observation to which the attention of the Members of the Yarkand Mission may be particularly directed.

As the Council of the Society have not been informed of the strength and qualifications of the scientific party which has been, or will be, selected to accompany the Yarkand Mission, or of the routes they will follow, and the facilities available for carrying out those investigations which seem the most desirable, it is somewhat difficult to form an idea of the particular branches of science in which the members of the Mission will best be able to make observations, but without going into details they will endeavour to notice the principal points to which attention may most advantageously be directed.

ZOOLOGY AND BOTANY.—The knowledge of Zoology and Botany to be obtained from these regions will chiefly depend upon the facilities and assistance which the Naturalist of the Expedition will have in procuring and transporting Zoological and Botanical specimens. There can be no doubt that both, and particularly the former, will prove of great interest, not only for the study of our Indian fauna, but also as being intermediate between that of India and Siberia on the one hand, and that of the Mediterranean-Caspian and the Northern Chinese and the Japanese on the other hand. It would be very interesting to notice whether any and which of the birds and also of the mammals which leave Siberia during the winter for the South, remain in the Trans-Himalayan valleys.

Such observations would greatly aid the study of the geographical distribution of animals. Reliable observations regarding the forms of animal and vegetable life at great altitudes will be of particular interest, and especially so on the Karakoram range, which is not only the true watershed between north and southern Asia, but virtually the average highest mountain range in the world.

If any limestone caverns be met with, they should be carefully searched, especially if of great extent, for any traces of the existence of a subterranean blind fauna such as has made the caves of Carniola in Europe, and of Kentucky in America, so famous. The position in the cave of such animals as may be found should be noted, so that the observations of Schiödte—that those animals nearest the mouth of the caves of Carniola were most nearly

allied to forms co-existing in the surrounding country, and had their eyes least affected of all, while of those that occupied the deepest recesses none had even representatives in the fauna of the country around, and all had their organs of vision completely aborted by disuse,—may receive corroboration.

GEOLOGY.—In Geology there is an immense field for observation. One of the principal tasks for the Geologist should be to construct a geological section across the Himalayan and Karakoram ranges, a section which would bear comparison with similar ones made across the Alps in Europe. It is needless to say that the officer entrusted with this work should be well acquainted with the geological structure of the Alps.

Collections of fossils made in these regions would materially aid in establishing a proper correlation between the geological formations of the Himalayas and those of the Alps. It is known from previous travellers that the large plain of Tibet was formerly inhabited by huge *Pachyderms* such as, Elephants, Mammoths, &c. similar to those which we find on this side of the Himalayas in the Sewalik deposits. As yet only stray fragments of these ancient relics have reached the scientific world, and an endeavour should be made not only to collect as many of these fossils as possible, but also to ascertain the age and stratigraphical relations of the deposits which contain them. Further, it is possible that the great Vienna and Hungarian Miocene basin, which gradually retreated towards the Caspian Sea as the centre, extended eastwards as far as the Pamir heights. Any information on the subject would prove of very great geological interest. We know on the one hand that the Eocene nummulitic deposits are found in Japan, while the southern parts of China, according to the recent explorations of Baron Richthofen, chiefly consist of crystalline and other rocks not younger than the Trias. It is possible that the Eocene Sea extended from Europe right through Central Asia to Japan. Geological data bearing on this subject should be recorded with particular care.

MINERALOGY.—Among useful minerals, Coal may be found, as it is believed that rocks of the carboniferous age have been brought from beyond the Karakoram. Again the Geological position of Jade, Turquoise, Amber, and other minerals brought from Trans-Himalayan regions, should as far as possible be ascertained. The Gold-washings should if possible be inspected.

PHYSICAL GEOGRAPHY.—The general physical features of a country are so intimately connected with its Geological Structure, that a Geologist ought to be able to do justice to them, if he co-operate with the Topographical Surveyor. Particular attention should be paid to the former extent and depth of the Central Asian lakes and water-basins, and their gradual diminution, because information on this subject will give us an idea of the former

greater richness of animal and vegetable life in those regions, and because it is intimately connected with evaporation. The existence and nature of saline deposits such as Borax, Salt, Carbonate of Soda, &c., should not be overlooked in connection with this subject. The extent, flow, and progress of glaciers should be noted.

The party should be supplied with the instruments necessary to make these observations, and also with a suitable instrument, by which the evaporating power of the air can be, at least approximately, determined at different elevations in the valleys and on large glaciers.

METEOROLOGY.—Whether Meteorological observations can be taken with any degree of fitness must depend greatly on the means of transport. If these do not admit of instruments being taken, other than such as are most compact and portable, it will be necessary to restrict the observations to the temperature and humidity of the air, to the direction and estimated force of the wind, the occurrence of rain, and the forms, quantity and movements of the clouds: but if the means of carriage suffice, a barometer, radiation-thermometer, an anemometer and an actinometer should be taken, and also a small rain-gauge. The chief points to which attention should be given are the following:

1. The diurnal range of temperature in the shade; which may be expected to be very great in so dry a country. Care will be required in selecting a proper place for the thermometers to guard them from being affected by direct radiation to or from the clear sky.

2. The minimum temperature of radiation at night should be observed whenever possible by a thermometer placed on the ground, and fairly exposed to the sky. In taking these observations, it is necessary, if the ground is not level, to place the instrument in a slight hollow or on black woollen cloth in a shallow box, or it will be affected by the convection of the air, and show a temperature many degrees higher than one protected from this influence. It is probably greatly owing to this cause that the registered temperature of nocturnal radiation at certain of the Himalayan stations appears to be but little below that of a shaded thermometer.

3. Any observations of the absolute heating power of the sun will be very valuable, since the dryness of the air is such, that its absorption of solar heat must be small. At such times particular attention should be paid to the clearness of the atmosphere from dust, since if a dust haze prevails to any great height, the absorption of solar heat by the atmosphere may be very considerable. If the means of transport do not allow of an actinometer being taken (Hodgkinson's is the best) the maximum heat of the sun, taken by a black bulb thermometer in vacuo, will be valuable.

5. Observations of barometric pressure will probably be made for the determination of heights. If possible, a few sets of hourly observations ex-

tending from midnight to midnight should be taken, for showing the range and periods of the diurnal oscillation. At the Himalayan hill stations, the morning minimum is most frequently the absolute minimum of the day, which is far from being the case in the plains of India.

It will be interesting to see whether on the more elevated parts of the Himalaya and Trans-Himalayan plateaux, the oscillation follows the same law as on the Indian plains or that of the hill stations. Also how the epochs of maximum and minimum vary in the higher latitudes.

6. A register of the direction and (in the absence of an anemometer) the estimated force of the wind according to the Brunfort Scale, is specially important. Particular attention should be given to the direction in which the clouds drift.

It is stated by Mr. Shaw that in Eastern Turkistan, the wind is chiefly from the north up to the great mountain range, whereas it appears from Hooker's and others' observations, that to the south of Tibet it is from the south at all times of the year. It is scarcely necessary to say that among the mountains, the winds are greatly affected by the direction of the valleys, so that the movement of the clouds is the best criterion of that of the great air currents. But any observations on the local variations of the wind will be of interest. Its diurnal changes in the valleys and in the passes are worthy of special observation. The violent winds from the south which blow through the passes during the afternoon hours are described by many travellers, and are referred by General Strachey to the heating and rarefaction of the air over the lofty table-lands of the interior.

Night winds also blow down the valleys, which are probably streams of air cooled by radiation and gravitating like water down the hill slopes and beds of the valleys. Any observation on them, the time they set in, their duration and force, and the temperature of these winds will be important. Also their upper and lower limits.

7. The humidity of the air will necessarily be very low. It should be observed when actinometer observations are taken; and whenever hourly observations of the barometer are made, those of the hygrometer should be made also. Besides these, observations of the wet and dry bulb thermometer should be taken at other times as often as practicable. The movements of the clouds have already been referred to. Their quantity, forms, and estimated height at different seasons should also be attended to. These and the wind observations may be made at all times without the aid of instruments other than a compass.

MAGNETIC OBSERVATIONS.—The only attempt to procure Magnetic Observations in Thibet and Turkistan of which the Council are aware, was made in 1857 by the Brothers Schlagentweit, one of whom lost his life in the expedition. They only made a small number of observations and none

have since been attempted, so that the magnetic condition of the country north of the Himalayas may be looked upon as utterly unknown.

John A. Bourn who made a Magnetic Survey of part of Southern India in 1854 remarked in the year 1860, that the magnetic lines in India are so abnormal, and so discordant with the usual theory, that a thorough examination of the whole area about the Himalayas was strongly to be recommended. As the subject is one of extreme importance and as the opportunity now presented of making such observations is one which may not occur for some time, the Council would urge upon the attention of the Government, the desirability of taking advantage of it as far as may be practicable and would suggest that Col. Walker, the Superintendent of the G. T. Survey, should be consulted on the subject, and be asked, if he has not already done so, to make arrangements for the supply of such of the necessary instruments as may be available in India, and can be taken with the expedition.

If possible the intensity should be determined at a few places, but if the time at the disposal of the observer should not be sufficient for the determination of this, observations of the declination and dip at even a few points would be valuable.

GEOGRAPHY.—The appointment of an officer of the G. T. Survey, under the direction of Col. Walker, R. E., is a guarantee that the interests of geographical science will be furthered to the utmost possible extent, and considering that Col. Walker is most probably in possession of all available information regarding the geography of these regions, it seems unnecessary to the Council to enter into details on this subject beyond pointing out the desirability of making, if possible, an exploration in advance, North and East from Yarkand, towards Karashar.

ETHNOLOGY.—An endeavour should be made to ascertain whether any traces of a pre-historic race of man exist. Caves and sub-recent gravel deposits ought to be searched for any human or animal remains they may contain. Attention should be paid to the physical characteristics of the different races inhabiting the regions visited by the Mission, and any information as to their origin, migrations, language and dialects, the distinctive appellations of the tribes and their subdivisions would be valuable. In all cases when possible, measurements, and photographs showing the general appearance and costume, as well as the distinctive facial characteristics and shape of the heads of males and females of the different races and tribes, should be taken and carefully recorded.

HISTORY AND ANTIQUITIES.—It is unknown what historical records and ancient remains exist in Turkistan, but every opportunity should be taken of securing oral and written information, with copies of any inscriptions bearing on the history and antiquities of the countries visited by the Mission.

Endeavour should be made to obtain the following MSS—

1. *Tārīkh i Rashīdī*, by Mīrzā Haidar Gūrgānī. It is a history of Káshghar to the reign of 'Abdurrashīd, king of Káshghar (16th century), and contains interesting descriptions of Tibbet, Káshghar and Kashmir.

2. *Tuzkirah Muqīm Khánī*.—A history of the Uzbek Kháns of Transoxiana.

3. Any other history of the family of Chingiz Khán, especially of more modern date. For the history of Káshghar during the 17th, 18th and 19th centuries we have no work whatever.

4. A *Tuzkirah*, or history of the literature, of Káshghar and surrounding countries.

5. *Nasabnámahs*, or genealogical works on the tribes in Kipchák, Bukhárá, Káshghar, and Mughulistán (Mongolia) in general.

A Collection of Coins, Plans, Photographs, and descriptions of Buddhist and Muhammadan antiquities will also be very valuable.

Mr. H. Rivett-Carnac said that, as being a member who seldom had an opportunity of attending the meetings of the Society, he had some diffidence in making a suggestion. He quite thought with the President, that the members of the Mission had been so well selected, that there was little likelihood of anything of real interest escaping their attention. But as the Government of India had asked the Society for suggestions, and as suggestions had been made in some detail on one or two points, he (Mr. Rivett-Carnac) would ask that the members of the Mission might be requested to gather what information they could regarding any tumuli, or barrows they might pass on their journeys. It would be very interesting to learn how far these tumuli resembled, both in their construction and contents, those discovered in many parts of India, and it might perhaps hereafter be possible to trace, with the help of an unbroken chain of these remains, the inroads, at a very early date, of tribes from the centre of Asia into India.

The following papers were read :

1. *Notes on Children found living with Wolves in the North Western Provinces and Oudh*.—By V. BALL, Esq., B. A., Geological Survey of India.

(Abstract.)

The author after some prefatory remarks, gives the following extract from a letter he had received from the Revd. Mr. Erhardt, Superintendent of the Orphanage at Secundra, in reply to his request for information regarding a boy in that Institution, who was alleged to have been found living with wolves.

"We have had two such boys here, but I fancy you refer to the one who was brought to us on March 5th, 1872. He was found by Hindus, who had gone hunting wolves in the neighbourhood of Mynpúri. Had been burnt out of the den, and was brought here with the scars and wounds still on him. In his habits he was a perfect wild animal in every point of view. He drank like a dog, and liked a bone and raw meat better than anything else. He would never remain with the other boys, but hide away in any dark corner. Clothes he never would wear, but tore them up into fine shreds. He was only a few months among us as he got fever and gave up eating. We kept him for a time by artificial means but eventually he died.

"The other boy found among wolves is about thirteen or fourteen years old, and has been here almost six. He has learnt to make sounds, speak he cannot; but he freely expresses his anger and joy; work he will at times, a little; but he likes eating better. His civilisation has progressed so far that he likes raw meat less, though he still will pick up bones and sharpen his teeth on them.

"Neither of the above are new cases however. At the Lucknow Mad-house there was an elderly fellow only four years ago and may be alive now, who had been dug out of a wolves' den by a European doctor, when, I forget, but it must be a good number of years ago.

"The facility with which they get along on four feet (hands and feet) is surprising. Before they eat or taste any food they smell it, and when they don't like the smell, they throw it away."

Mr. Ball then quotes the well-known story (*vide Ann. and Mag. Nat. Hist.*, 1851 p. 163) of the capture of one of these wolf-reared children on the banks of the Gumpti, who was afterwards taken to Lucknow and who is in all probability the "elderly fellow in the Lucknow Mad-house" referred to in Mr. Erhardt's letter.

The writer then draws attention to a remarkable feature in all the stories, viz., that the wolves are invariably alleged to have communicated much of their natural ferocity and notably untamable disposition to their foster children, and attempts to account for their somewhat un wolf-like treatment of them.

The author, in conclusion, states that his object in putting forward this account, is to bring about a thorough investigation of a subject which, if these stories of wolf-reared children could be substantiated, must prove of considerable physiological interest and importance.

Mr. Blanford said he could not think the evidence adduced by any means satisfactory, and he would be glad could any one endowed with some amount of judicial scepticism, visit the Secundra Orphanage and ascertain as far as possible on what kind of testimony, these accounts of wolf-children

really rested. He did not of course question that the Superintendent of the Secundra Orphanage wrote in good faith that which he really believed.

After some further discussion it was agreed, on the motion of the President, that the Secretary should write to the Superintendents of the Secundra Orphanage and the Lucknow Lunatic Asylum so as to obtain, if possible, further information on the subject.

2. *Rude Stone Monuments in Chutiá Nágpur*.—By COL. E. T. DALTON, C. S. I., Commissioner of Chutiá Nágpur.

(Abstract.)

Col. Dalton describes in this paper the sepulchral and monumental stones of the Kols. He first mentions those which he saw in the Saranda Pir (Singbhum District), the inhabitants of which are of the Munda type of Kols, who, to judge from their Mongolian features, are a very primitive race. The author also gives a sketch of the great Muuda burial ground of Chokahatu, 'the place of mourning,' in Lohárdaggá District, where he counted 7,360 tombs, mostly of the dolmen or cromlech form, all close together, covering an area of seven statute acres. The horizontal slabs of the tombs are generally huge masses of gneiss, often exceeding 15 feet in length and 4 feet in breadth.

The monumental stones are less in number than the sepulchral, and they resemble in many details the Kasia cenotaphs described by Col. Yule.

Photographs of the Chokahatu Burial Ground and sketches of monumental stones accompany the paper.

Mr. Blanford said, any one acquainted with the monuments of the Khasia Hills must be at once struck with the many points of resemblance between them and those, sketches of which accompany Col. Dalton's paper. The most important point to be noticed is the association of the upright stone, the *menhir* with the low flat *dolmen* in front; an association which is invariable on the Khasi Hills, and, according to Major Godwin-Austen's account, has not received any other explanation than that of custom. He says "The tall upright stones are called *Mao bynna*, from *mao*, a stone, *bynna* to make known, literally 'a monument.' They are also known by the term *Mao shinran*, the male stone, while the flat seat-like slab in front, is called *Mao Kynthai* the female stone, representative of all life, being in pairs. My informant explained this, by saying the monument would be imperfect without the flat stone or its female adjunct." The similarity of the arrangement, combined with the fact that the Mundas are stated by Col. Dalton to have a decided Mongol physiognomy, is very remarkable, and suggests a closer connection than usual between two tribes now separated by the whole extent of the plains of Bengal.

On the other hand, certain important differences must not be overlooked. First in the number of the *Menhirs*. Col. Dalton's sketches exhibit a single *menhir* to each *dolmen*. This the speaker believed is never the case on the Khasi Hills. The number is never less than three, and the greatest number noticed by Major-Godwin Austen is eleven, the number being, however always odd. Again, it appears from Col. Dalton's account, that the Munda stones are sepulchral monuments. This is not the case on the Khasi Hills, at all events now. They are there of a votive character and have no connection with funeral customs. A person who is ill or who desires the assistance or protection of an ancestor, vows a certain number of stones, if he recovers from his illness, or if the ancestor proves propitious. The ancestor who is supposed to have power in the case in question, is discovered by the breaking of eggs or other means of divination, and sometimes when the favours are prolonged and repeated, additional stones are set up, in acknowledgement of the benefits received.

Col. Dalton does not refer to Major Godwin-Austen's account and may not have seen the original, but he is probably acquainted with it as it is quoted in Fergusson's 'Stone Monuments' of which he speaks in his paper. The original, published in the Journal of the Anthropological Institute is the most complete description the speaker had seen of the stone monuments of the Khasi Hills. If Col. Dalton should have any further opportunity of examining the Munda monuments, it would be of interest to ascertain whether there is no instance of a multiple arrangement of the *menhirs*, and whether they are ever set up as votive memorials. His account seems to leave no doubt as to the sepulchral character of those he describes.

Mr. H. Rivett-Carnae submitted that the paper, with its illustrations, contributed by Colonel Dalton was of the greatest interest, as giving another case of a tribe, living in an unfrequented hill-country, which appeared to have practised from time immemorial, and still to continue to practise, a system of erecting monuments over their dead, similar to the pre-historic remains observed in the hill-country, and comparatively inaccessible tracts of other parts of India. In the basalt, or trap country, where boulders of trap only could be obtained, the tumuli took the form of barrows, or circular mounds surrounded with boulders. When the sandstone formation was reached, where it was not difficult to split the block of stone into slabs, burying places somewhat similar to these shewn by Colonel Dalton, took the place of the barrows. These had been figured, and described by Colonel Meadows Taylor, C. S. I. and other members of the Society, and he (Mr. Rivett-Carnae) had had the honor of bringing the subject of some of the tumuli in Central India to the notice of the Society.

His chief interest in these tumuli and their contents was their striking resemblance (pointed out by Colonel Taylor) to those that existed in many

parts of Europe. During his recent visit home, he (Mr. Rivett-Carnac) had had an opportunity of visiting the excellent Prehistorio Museum presented to the town of Salisbury by Messrs. Blackmore and Stevens, and he had been much struck with the great similarity between the remains dug out of the barrows of Central India, (which had been exhibited to the Society) and those discovered in the English Barrows.

As in Europe so in India, these tumuli were generally to be found in what, for a long time, at least, must have been very inaccessible parts of the country. The tribes in India who kept up the old customs were, so far as he could understand, quite a different race from their neighbours of the plains, and the view seemed to be generally accepted that these hill-men were all that now remained of the tribes found in India by the Aryans on their taking possession of the country. Future enquiries, and discoveries might, perhaps, establish the view which had been suggested in many quarters, that the builders of the tumuli in Europe and Asia were originally of the same Central Asian stock, one portion of which, in ages past had marched westward, another moving southward towards India. As time went on other, other and more powerful hordes, following the same routes taken by their predecessors several centuries before, drove into the woods and fastnesses these so-called aboriginal tribes, whose common origin is suggested by the similarity in the monumental remains found in many parts of Northern Europe, and also in Central and Southern India, and among the hills inhabited by the tribes of which Colonel Dalton had given the Society so interesting a description.

Dr. Anderson remarked that the fact mentioned by Col. Dalton that the Mundās of Chutiā Nāgpūr exhibit distinct traces of a Mongolian origin in the style of their features was one of great interest. Many years ago, Mr. Logan had pointed out, and more recently Sir George Campbell, that there is a similarity between the language of the aboriginal tribes of Chutiā Nāgpūr and the language of the Burmo-Malayan people. In connection with this subject, there is an interesting commentary, or verification of Col. Dalton's statement regarding the Mongolian affinity of the Kolarians, to be found in the last number of the Philological Section of the Asiatic Society's Journal. There Sir A. Phayre points out that the first syllable of the word Mundā which is the word used to designate the language of several tribes of the western highlands of Bengal, is identical with the race name of the people of Pegu, and he is of opinion that the Mun or Talaing people of Pegu are of the same stock as the Kols. Thus these two authorities arrive at the same conclusion independently of each other and by two widely different methods.

The word Muang which is of such frequent occurrence in Western Yunan, and along both banks of the Cambodia, would seem to be the same

as the Pegu Mun, for it means a district or country. In all probability, it was first applied to the aboriginal people of these parts, but as they gradually disappeared before the conquerors, or were absorbed by them, it was eventually transferred to the country which they had inhabited, or was restricted to districts in which they had been originally in great force. We thus find in Yunan Mungla, which would appear to be identical with the Kolarian Munda.

Col. Mainwaring said—

I have been requested to say a few words with regard to a remark made by Sir Arthur Phayre in his interesting narrative 'On the History of Pegu' which appeared in the last number of the Asiatic Society's Journal. In alluding to the inhabitants of Pegu, who, Sir A. Phayre says, are called "Mun, Mwon or Mòn," he refers to Csoma de Kőrös' Tibetan Dictionary for the definition of the word, there rendered,—a general name for all the people between Tibet and the plains of India,—by which Sir A. Phayre infers, that the inhabitants of Pegu may have originally emigrated from the Hills near Tibet. Csoma De Kőrös, when inscribing the aforequoted passage in his Dictionary, must have been mistaken or must have written vaguely: for of course there are numerous tribes who inhabit the hills between Tibet and the plains of India, and to all of these, the term Mòn is certainly not applied by the Tibetans. The appellation may have formerly been, or may still be, given to other races, but in Sikim and the neighbouring countries north and east, the Tibetans apply the term Mon alone to the Lepchas. None of the other races are so denominated; for instance the race, Europeans call Butia, (which literally means 'a Tibetan,' from འབྲུག་ *Bod*, *Tibet*), they distinguish by the name of Hlo-pa, literally *Southerners*; the Nepalese they call 'Bal po' (from བལ་པོ་ *Bal po yúl*, the country of wool), &c. It might therefore be considered probable that the inhabitants of Pegu and the Lepchas might have originated from one source. The physical conformation and features of the Mon of Pegu, as represented by Sir A. Phayre, certainly correspond to that of the Lepcha; he describes them as short, stout and fair, especially the Karen tribes, who when young, "are not darker than southern Europeans." The great criterion, however, the language, tends to prove that no affinity exists between them. From test-words in the Mon language of Pegu, taken from Dalton's Ethnology, I can find no analogy between that language and the Lepcha tongue. Sir A. Phayre ascribes the fairness of complexion that exists among the Pegu race, to local causes. I should certainly not assume the same cause for that of the Lepchas, whom I have often seen, especially in former days, quite as fair as Europeans; that they must have emigrated, at some early period, from beyond the Himalayas, is undoubted; a people and language, so noble and perfect such as existed under the name of Róng, (by Europeans designated

Lepchas), when Darjiling was first established, could never have been generated in the wilds and isolation of the Himalayas, the body of the people may still exist, and may, perhaps, yet be discovered, probably in the north of China about Mongolia or Manchuria.

The receipt of the following communications was announced—

1. On a new species of Kite. By A. Anderson, Esq., with a note by W. E. Brooks, Esq., C. E.
2. Rude Stone Monuments in Chutia Nagpur. By Col. E. T. Dalton C. S. I.

LIBRARY.

The following additions have been made to the Library since the meeting held in May last.

Presentations.

•• Names of Donors in Capitals.

Bulletin, Mars 1878.

Col. H. Yule.—*L'orographie et le system des eaux du Pamir.* (Extract from the author's essay in Wood's "Sources of the Oxus"). N. de Khanikoff.—*Les documents sur le Khanate de Khiva.* (An abstract of the sources of information available regarding the Khanate of Khiva). Vivien de St. Martin.—*Voyage d'exploration en Indo-Chine.* L'Abbé Desgodins.—*Végétation des sommets au Nord de Yerkalo.* Hauteurs entro Yerkalo et Bathang. (The first of these papers also contains some meteorological observations taken on the range separating the Lan-tsang Kiang from the Kin-cha-Kiang near Yerkalo.)

THE GEOGRAPHICAL SOCIETY OF PARIS.

K. Preussischen Akademie der Wissenschaften zu Berlin. Monatsbericht, December, 1872.

Poggendorff.—*Beitrag zur näheren Kenntniss der Elektromaschine (Zweiter Art).* Peters.—*Über Hydrus fasciatus*, Schneider, und einige andere Seeschlangen. Hagen.—*Beobachtungen über die Bewegung der Luft und des Wassers.*

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN.

Institution of Mechanical Engineers, Proceedings, Oct. 1872.

A. Morton.—On the ejector condenser for steam engines, dispensing with an air pump. A. C. Hill.—On the working of the improved Compound Cylinder Blowing Engines and Howard Boilers at the Laeknby Iron Works, Middlesbrough. Colonel Clay.—On an improved construction of Tool for Turning metals at increased speed.

THE INSTITUTION OF MECHANICAL ENGINEERS, BIRMINGHAM.

Bengal Social Science Association, Transactions, Vol. VI.

Address by the President. The Hon. J. B. Phear.—On some features of Litigation in Bengal. W. Clarke.—On Tied Arches. The Rev. J. Long.—Village communities in India and Russia. Mr. J. Geoghegan.—Indian Cooley Emigration. Peary Mohun Mookherjee.—Agriculture in Bengal.

THE BENGAL SOCIAL SCIENCE ASSOCIATION.

Geological Survey of India.

Memoirs, Vol. X, pt. I.

R. B. Foote.—Geology of Madras. *H. B. Medlicott*.—Sátpura Coal Basin.

Palæontologia Indica, Vol. IV. Pt. 4 Cretaceous Fauna of Southern India.

Dr. F. Stoliczka. The Corals or Anthozoa, &c.

Records, Vol. VI. pt. 2.

V. Ball.—The Bistrámpúr Coal-field. *F. R. Mallet*.—Mineralogical Notes on the Gneiss of South Mirzapur and adjoining country.

THE SUPERINTENDENT OF THE GEOLOGICAL SURVEY OF INDIA.

Sketch Map of the Countries between Hindustan and the Caspian Sea April 1873.

THE SURVEYOR GENERAL OF INDIA.

Indian Museum.

Minutes of the Trustees, from Sept. 1866 to March 1872.

TRUSTEES OF THE INDIAN MUSEUM.

Martyn's Universal Conchology, 2 Vols.

DR. F. STOLICZKA.

Report of the Sanitary Commissioner for Bengal for 1871, by Ch. J. Jackson, M. D.—Report on the Administration of the Registration Department in Bengal for 1871-72, by H. Beverley.—Report on the Administration of the Salt Department for 1871-72.

THE GOVERNMENT OF BENGAL.

Exchange.

Nature, Nos. 180-183.

Purchase.

Pratna-kamra-Nandini, Vol. VI. No. 1.

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR JULY, 1873.

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A meeting of the Asiatic Society of Bengal was held on Wednesday, the 2nd instant, at 9 o'clock P. M.

Col. H. Hyde, R. E., President, in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen duly proposed and seconded at the last meeting were balloted for, and elected ordinary members—

H. M. Durand, Esq., C. S.

Captain E. A. Fraser, 3rd M. L. C.

C. W. Marshall, Esq.

The following are candidates for ballot at the next meeting—

J. C. Parker, Esq., Calcutta, proposed by J. Wood-Mason, Esq., seconded by Capt. J. Waterhouse.

W. J. Olpherts, Esq., proposed by Walter Bourne, Esq., seconded by W. E. Brooks, Esq., C. E.

Lieut. C. T. Bingham, Bengal Staff Corps, proposed by Lieut.-Col. J. Y. Gowan, seconded by Capt. J. Waterhouse.

Kumára Grischandra Sinha Bahádur, proposed by Bábu Rájendralála Mitra, seconded by Col. H. Hyde, R. E.

Bábu Jogeshchandra Dutt, proposed by Bábu Rájendralála Mitra, seconded by H. Blochmann, Esq., M. A.

Alexander Pedler, Esq., proposed by H. F. Blanford, Esq., seconded by H. B. Medlicott, Esq.

Col. W. E. Marshall, Bengal Staff Corps, D. P. W., Fyzabad, proposed by J. Ewart, Esq., M. D., seconded by Capt. J. Waterhouse.

W. G. Bligh, Esq., Asst. Engineer, Agra Canal, proposed by F. S. Growse, Esq., M. A., C. S., seconded by H. Blochmann, Esq.



Capt. W. F. Badgley, B. S. C., Deputy Superintendent Topographical Survey, proposed by Major H. H. Godwin-Austen, seconded by Capt. J. Waterhouse.

Lieut. R. G. Woodthorpe, R. E., Assistant Superintendent Topographical Survey, proposed by Major H. H. Godwin-Austen, seconded by Capt. J. Waterhouse.

The President announced that the Council have nominated Col. J. E. Gastrell as a Trustee of the Indian Museum, on behalf of the Society, in place of Dr. Stoliczka.

Mr. H. B. Medlicott exhibited a stone implement from the Ossiferous "Pliocene" deposits of the Narbadá valley.

Mr. Medlicott invited attention to the perfectly regular, pointed oval, form of the celt as proving it to be unquestionably manufactured. On the important point of geological position, it is equally satisfactory, having been dug by Mr. Hacket of the Geological Survey, out of the stiff clay on the bank of the Narbadá near Bhutrá, north of Gadarwara. Some twenty feet of ossiferous gravel rested on the clay; the whole being about one hundred feet below the present surface-level of the deposits. Dr. Falconer from first to last applies the term Pliocene to these beds and to their mammalian fossils, and with the conviction that human remains would be found in them.

Mr. Medlicott drew attention to the immense antiquity implied by the name Pliocene; and proved from Dr. Falconer's own writings that it had been knowingly applied by him, quite independently of its fixed meaning in the scale of geological formations, and simply as expressing for the mammalian fauna that approximation to existing forms by which relation, as applied to the molluscan fauna, the name was intended, and is universally used, to indicate the youngest Tertiary formations. Dr. Falconer pointedly noted the great distinctions of the old Narbadá fauna from that of the Siválíks, and its strong affinities with existing forms; nowhere insisting upon it as *specifically* Pliocene.

Mr. Medlicott further pointed out from purely geological considerations that no such antiquity could be assigned to the old alluvium of the Indian rivers; that he could not regard them as older than the late Pleistocene or Quaternary, *i. e.* on about the horizon of the implement-bearing gravels of the river-valleys of northern Europe.

Mr. Blochmann exhibited several rubbings and tracings of inscriptions received from Jaunpúr, Pánipat, and Muzaffarnagar, the former from General Cunningham, the latter from Mr. J. G. Delmerick, Dihlí, and Mr. A. Cadell, C. S. He said—

At the January meeting of the Society I exhibited a large number of Bengal inscriptions received from General Cunningham, and I now propose to exhibit, at this and subsequent meetings, his inscriptions from various places in the North-Western Provinces. I shall commence with the five inscriptions of the bridge over the Gumtí at Jaunpúr. The bridge was built in 975 (or 975-76) A. H., or A. D. 1567-1568, by a Kábulí architect (*ustád*) of the name of Afzal 'Alí, at the cost of Mun'im KhánKhánán.\* In the existing gazetteers, it is stated on the authority of the *Jaunpúrnámah* that the builder is Fahím, a freed man of Mun'im Khán; but we know from history that Fahím was a slave of Mun'im's successor, Mirzá 'Abdurrahím KhánKhánán (Aín translation, p. 338).

### Jaunpúr.

#### I.

خان خانان منعم عالم مدار \* بست این پل را بتوفیق کریم  
نام او منعم از آن آمد که هست \* بر خلائق هم کریم و هم رحیم  
از صراط مستقیمش ظاهر است \* شاه راهی سوی جنات النعیم  
رو بناربخش بری گز افکنی \* لفظ بد را از صراط المستقیم  
حق سبحانه و تعالی این بناء را در پناه خود دارد \* قلیله و کاتبه محمد  
محسن المذنب ابن امیر هاشم //

1. Khán Khánán Mun'im, the centre of the world, built this bridge by the grace of the Bountiful.

2. His name is Mun'im ['one who confers benefits'], because he bestows favors upon mankind and shews mercy.

3. He has thus opened for himself a passage over the *Qirát i mustaqím*† towards the beautiful gardens of Paradise.

4. You will arrive at the date if you throw the word *bad* out of '*Qirátul-mustaqím*.'

May God Almighty have this building in His keeping! The composer and writer of these verses is Muhammad Muhsin, a sinful man, son of Amír Háshim.

The value of the letters of the words '*Qirátul Mustaqím*' is 981, and if we subtract the value of the letters of '*bad*,' i. e. 6, we get  $981 - 6 = 975$ , A. H. The metre of the verses is short *Ramál*.

#### II.

سپهر کرم خان خانان که باشد درش قبله جمله دلہای آگاه  
پلے بست از سنگ بر روی دریا کزو بگذرند اہل دل گاہ و بیگاہ  
چو از فضل اللہ شد بستہ این پل از آن گشت تاریخ آن فضل اللہ

\* His biography will be found in my Aín translation, pp. 317, 384. The *tárikh* given there is corrected below. Vide also Stewart's History of Bengal, p. 103.

† The faithful before entering Paradise have to pass over a bridge called *Qirát ul mustaqím*, 'the established path,' which leads over a bottomless pit, but is as narrow and as sharp as the edge of a sword.

1. The Khán Khánán of heavenly bounty, whose door is the cynosure of all wise hearts,
2. Built a stone bridge over the surface of the river, over which good people pass at all times.
3. As this bridge was built by the grace of God, its *tárikh* is the words 'Fazli allah' [the grace of God].

This gives 976 A. H. The metre is *Mutaqárib i sálim*.

### III.

این عمارت عالی و اساس متعالی در ایام دولت حضرت السلطان الاعظم و  
الخانان المعظم مظہر آثار السلطان ظل اللہ ابو الغازی جلال الدین محمد اکبر  
پادشاہ از خالص مال صاحب ہمت خیرمی اتمام یافت کہ نام و سال بنای و  
اتمامش ہست این کل \* بانہی این منعم خان \*

This lofty edifice and noble foundation was successfully completed in the reign of his Majesty, the great Sultán, the exalted Kháqán, in whom the marks of royalty appear, the shadow of God, Abul Gházi Jaláluddín Muhammad Akbar Pádisháh, at the private cost of the generous Lord. The following *tárikh* contains his name, and the year in which (the bridge) was built and completed—'The builder of this (is) Mun'im Khán.' [A. H. 975.]

### IV.

این پل عالی باہتمام نتیجہ نتایج العظام \*\*\* فی (؟) الانام خواجہ نظام الدین  
کہ \*\*\* [پسر] حضرت مخدومی اعظم اند قدس سرہ العزیز و بہنرمندی نادر  
العصر استاد افضل علی کابلی باتمام رسید ||

This lofty bridge was completed under the superintendence of the effect of great effects [one word illegible] among men, Khwájah Shaikh Nizámuddin, who is the son of Hazrat Makhdúm i 'Azam—may God sanctify his dear secret!—and by the skill of the master of the age, Ustád Afzal 'Alí of Kábul.

### V.

The last inscription is a Rubá'í, of which, however, the first line is illegible. The last is—

تاریخ بنای آن چو جستم از غیب      گفتند پل محمد منعم خان ۹۷۵

When I looked for a *tárikh* from the unseen world, (angels) said—'The bridge of Muhammad Mun'im Khán.' A. H. 975.

Maulawí Khairuddin of Alláhábád has given in his Jaunpurnámah the first two inscriptions, together with a description of the bridge itself.

In the third inscription, Akbar is called Abul Gházi, instead of Abul Fath.

### 2. Pani'pat.

Mr. J. G. Delmerick has sent to the Society a tracing of the following inscription from Páni'pat.

بانی این عمارت فیروز محمد لطف الله افغان بانی این خیر در عهد سلطان  
السلطین سکندر شاه بهلول شاه سلطان بکرم باری تعالی توفیق یافت تا گنبد  
حظیرہ بندگان شیخ المشایخ و الاولیاء شیخ جلال الحق و الشرع والدین قدس الله  
سره العزیز برآورد بتاریخ دوم ماه شوال سنه اربع و تسعمایه ۱۱

The builder of this edifice is Firúz Muhammad Luṭfallah, the Afghán. The builder of this religious edifice, during the reign of the King of Kings, Sikandar Sháh, son of Buhlál Sháh, the king, was by the kindness of God vouchsafed the grace to erect the vault of the tomb of the revered Shaikh of Shaikhs and saints, Shaikh Jaláluddín (the glory of truth, the law and the faith)—may God sanctify his dear secret ! Dated, 2nd Shawwál, 904. [13th May, 1499, A. D.]

Nothing is known of the builder. The saint, however, is a well-known personage, and all biographical works on Muhammadan Saints contain biographical notes of him. His full name is Shaikh Jaláluddín, (son of) Mahmúd of Kázárún, a town in Persia; but his real name was Muhammad, son of Mahmúd, Shaikh Shamsuddín Turk of Pánipat having conferred on him the title of Jaláluddín, 'the glory of the Faith.' He is the author of the *Zád ul-akbar*, and he was twice in Makkah. It is said that he daily fed one thousand people, and even during his hunting excursions, of which he was passionately fond, his table always contained miraculously food for one thousand people. Many miracles are related of him. He was in high favour with Firúz Sháh. Shaikh Jalál died on the 13th Rabi' I, 765 (20th December, 1363) and lies buried, together with his five sons, in Pánipat.

## II.

Mr. Delmerick also sent a tracing of a Hindústání inscription from Pánipat. It seems that the tomb of Ibráhím Lodí was repaired in 1867 by the local authorities of that town; but unfortunately they have given the emperor Bábar a wrong name, calling him Ghiyásuddín Bábar, instead of Zahiruddín Bábar.

یہ قبر بادشاہ ابراہیم لودی کی ہے کہ بمقاتلہ بادشاہ غیاث الدین بابر کے پانی پت  
میں کلان جنگ میں ساتھ اپنی فوج کے قتل ہوا سنہ ۹۳۴ ہجری میں اور  
یہ قبر سنہ ۱۸۶۷ عیسوی میں مرمت و درست ہوا ۱۱

## Muzaffarnagar.

From A. Cadell, Esq., C. S., the following readings of inscriptions from Majherah and Mornah, connected with the Sayyids of Bárha\* (Muzaffarnagar District).

\* *Vide* Ki'n translation, pp. 389 to 395; Journal, A. S. Bengal, for 1871, Pt. I, p. 260; Proceedings, A. S. Bengal, November, 1872, p. 166.

## I.

پادشاه جرم مارا در گذار ما گنهگاریم تو آمرزگار  
 تو نیکوکاری و ما بد کرده ایم جرم بی اندازه یلحد کرده ایم  
 تاریخ وفات سعادت مآب مرحومی مغفوری میران سید حسین پنجم شهر  
 جماد الثانی سنه الف هجری \*

1. O Lord, forgive our sins; for we are sinners, and thou art forgiving.

2. Thou art good, but we are wicked and have committed endless crimes.

The date of the death of Mirán Sayyid Husain, the good, who has obtained pardon and forgiveness, is the 5th Jumáda, II, 1000. [9th March, 1592.]

## II.

در عهد محمد شاه پادشاه غازی این مسجد را معصوم زمان بی بی جهبوبر  
 مبلغ نه هزار روپیه در شهر صفورسنه یکهزار و یکصد و سی و هشتم هجری  
 مطابق سنه هشتم جلوس والا تعمیر کنانید \*

*From the Mosque at Mornah.*

In the reign of Muhammad Sháh, Pádisháh i Ghází, this mosque was ordered to be built by the chaste lady of the age, Bibí Jhabbú, at the cost of nine thousand rupees, in the month of Qasar, 1138, [October, 1725], the eighth year of the auspicious accession.

Mr. Cadell writes—"This is one of the last of the substantial Sayyid buildings. Bibí Jhabbú was the wife of Nawáb Hasan Khán, an Imperial Bakhshí, during the reign of Muhammad Sháh. Mornah is a Chatraurí settlement, and the Mornah Sayyids with other Chatraurís came to the front when the Tihanpúrís lost ground."

The following papers were read—

1. *On a new species of Kite, and notes on the genus Milvus generally.*—By ANDREW ANDERSON, Esq., F. Z. S., with a note by W. E. BROOKS, Esq., C. E.

(Received 5th June, 1873)

It is now nearly three years since I first recognized an undescribed species of *migratory* kite which appears to have escaped the notice of Indian Ornithologists, and the matter has been allowed to remain *sub judice* until I could be quite certain that the bird now brought before the public was really new to science. I have, however, alluded to it from time to time in a series of papers that have been published by the Zoological Society of London, ("Notes on the Raptorial birds of North Western India"), from which

the following extracts are taken, as giving some particulars relative to the habits of the bird in question.

"I have, however, specimens of a kite with all the characters of *Milvus major*, but considerably smaller. It is also a cold weather visitant, and is equally shy as the former. Mr. Brooks has examined these kites in my collection and agrees with me in referring them to another species: they may be *Milvus affinis*, or perhaps more probably *M. melanotis* of Temminck."

"Undoubtedly we have three species of kites in India, two of them being migratory." P. Z. S. 1872, p. 79.

"The small Marsh kites I have before referred to (p. 79) first made their appearance in ones and twos before the end of September; and they were then terribly wild; just as much so as *Milvus major*. Later in the season (December and January,) they became gregarious, and confined themselves to marshes and grassy swamps. As the season advanced, so their wariness seemed to wear off; and as the country dried up, they began associating with the village kites, till they became just as audacious as their allies *M. Govinda*.

"I have seen as many as fifty of the small Marsh kite on the wing at a time; and the conspicuous white or pale-buff patches under the wings suffice to distinguish them from the village kites at a glance."

"Early in the season the Marsh kites appear to keep to the open country, and then do not intermingle with the other species; but I have come across numerous places where villages are situated on the banks of swamps; and then, of course, both kinds are always to be seen together. They have now (14th March,) nearly vanished, and by the end of the month I do not think one will be left." P. Z. S. 1872, p. 623.

*MILVUS PALUSTRIS*, sp. nov.

The kite for which I have proposed this name, is somewhat smaller than *M. govinda*, Sykes; but in point of coloration it is very nearly a *facsimile* of *M. major*, Hume; in fact a perfect miniature of that species. While the amount of white under the wings, extending in some examples to two-thirds of the length of the primaries (confined, however, to the inner webs), and the rich rufous tone of the plumage generally, tend to assimilate *M. palustris* to *M. major*, these characters tend equally to separate the former from either of the other two species, viz., *M. Govinda* and *M. affinis*, Gould (P. Z. S. 1837); *i. e.*, supposing the latter to be really worthy of specific distinction as an Indian bird.\* There is also a considerable amount

\* Mr. Blyth, in his "Commentary on Dr. Jerdon's 'Birds of India.'" (Ibis, 1866, p. 248), does not appear to think that the ordinary Indian Kite is separable into two species:—"In every assemblage of Indian Kites there is much disparity of size, some males being considerably smaller than the largest females; and the former would

of white and pale buff about the head and neck of the new bird, which is never present in its common congener *M. govinda*, from which it has not hitherto been discriminated.

The following are the dimensions of specimens that have been forwarded to illustrate this paper:

|                                |        |     |       |      |     |     |
|--------------------------------|--------|-----|-------|------|-----|-----|
| No. 1 ♀ Etáwáh district,       | Length | 22  | in.;  | wing | 17  | in. |
| No. 2 ♀ Mainpúri district,     | "      | 21  | " ; " | "    | 16½ | "   |
| No. 3 ♂ Etáwáh district,       | "      | 20½ | " ; " | "    | 16  | "   |
| No. 4 ♂ Sháhjahánpúr district, | "      | 20  | " ; " | "    | 16  | "   |

These measurements correspond with those of the Australian bird (*M. affinis*, Gould), which Mr. Gurney states he has received from parts of India, and which Mr. Hume\* separates from *M. Govinda (vera)*, on account of "its duller tints, and smaller size."† The italics are mine. The new kite, therefore, cannot be the Australian bird (*M. affinis*), for, so far from approaching *M. Govinda* in coloration, it differs widely from that species: (1) by its *rufous toned* plumage, and (2) by the *white under the wings*; which are characteristic of our new bird.

Neither can it be *M. melanotis*, Temminck, as I at one time supposed it might have been; for Mr. Gurney informs me (in epist.) that specimens of this kite, which he has received from Japan, vary from 25 to 28½ inches in length (according to sex), with wings from 18½ to 21½ inches long, which measurements are exactly similar to those of *M. major*.‡ For the sake of comparison I forward a ♂ specimen of this kite, to shew the vast difference in size between it and our new bird; and yet how close they are in point of colour.

At one time I was inclined to believe that the subject of the present paper was perhaps only the young of *M. Govinda*; but a comparison with a Futtehghurh-born bird,§ will shew that this is quite impossible. The difference between the two species is sufficiently striking to be quite apparent to an ordinary observer.

seem to be undistinguishable from the Australian *affinis*; but I am not disposed to accept the opinion that there are two separable races of *Milvus* in the Indian and Indo-Chinese subregions." &c., &c.

\* Cf. "Stray Feathers," 1873, p. 161.

† The examination of a large series of the common kites clearly shows that it is quite impossible to say where *affinis* ends, and where *Govinda* begins. As to the "duller tints" of the former, I find that this peculiarity is far from constant; and as to its "smaller size," I would give it as my opinion, that merely nominal difference in this respect in a bird measuring twenty one inches long cannot be sufficient to constitute a distinct species.

‡ Mr. Hodgson was aware of the existence of this large kite, as his drawings contain figures of it under the name of "*Milvus Indicus*," Hodgson.

§ Also sent with this paper.

The small Marsh kite is an extremely abundant species in the N. W. Provinces, and its appearance in September or October is a sure harbinger of the cold weather. It is gregarious, associating at times in large flocks; and in this respect it differs from its larger ally (*M. major*) which, as a rule, is a solitary bird.

Early in the season they are both extremely shy, thus affording a marked contrast to the permanently resident species (*M. Govinda*).

The summer habitat of *M. palustris* is still a desideratum. I have satisfied myself beyond doubt that it does not breed within our limits, numerous dissections proving the bird to be a late breeder.

In concluding my remarks on this subject, I wish to place on record the probable existence of another species of kite, considerably *black-er* and *larger* than the ordinary run of full sized *Govindas*. I have one specimen of this kite, a ♂ of the same dimensions as *M. major*, but differing in the shape of its nostril (a characteristic feature in Raptorial birds) from *all the other Indian species of Kites*.

At first I inclined to the belief that in this bird I had got hold of the European *M. migrans*, Bodd; the more so, as Mr. Gurney has recorded it from Afghanistan. But on comparing this large black kite with a Russian-killed *M. migrans*, the difference between the two birds is very marked. The former was a breeding bird, with testes enormously developed, or I might have been inclined to have considered it merely a melanoid variety of *M. major*.

*Note by W. E. Brooks.*

I quite agree with my friend, Mr. Anderson, in separating this kite.

The tendency to pale buff under the wings is a remarkable characteristic of *M. palustris*, to which *M. major* is not subject; and in this respect it is not always an "exact miniature" of its large congener.

I have long known this kite, and once imagined it to be *M. melanotis*, Temm. and Schl. but the latter is now, I think, almost proved to be identical with *M. major*, Hume. I quite believe in their identity; for a bird so strikingly resembling *M. major* as *M. melanotis* does according to all accounts, *is sure to have a corresponding amount of white under the wing*. The alleged want of white in the wing of the latter is the only difference observed. This amount of white under the wing of *M. major* is variable; sometimes it is clear white, at other times only a mottling of white on the basal half of the inner webs of the primaries.

With reference to the idea entertained by Messrs. Hume and Anderson that there are two species of dusky kites of the *Govinda* type in India; I cannot believe in anything of the sort. I have one of the larger dusky kites referred to by Mr. Anderson, and I have examined his bird too; I have also



collected kites numerously from Etáwah to Asansol, places distant apart about 700 miles, and I cannot find any specific difference in plumage. The wing varies from 16 to 18 inches in length; but this is no greater variation than *M. major* is subject to; and the range of wing in *Aquila bifasciata* is from 20 to 24 inches, according to specimens in my collection. The dusky kites can be obtained *with any length of wing between 16 and 18 inches*, but they are one and all precisely identical in other respects. *The male, too, is often quite as large as the average female.* This should be taken into account before making another species of Govind kite. I do not agree with Mr. Anderson regarding the difference of nostril. Many of my smallest Govind kites have the same nostril. It is just such an amount of slight individual variation, as regards nostril, as I have observed in other species.

I think, therefore, that we may safely conclude that we have only three true kites in India: *M. melanotis*, *M. Govinda* or *affinis*, and *M. palustris*.

I have never seen Indian-killed examples of *M. migrans* or *M. Ægyptius*.

With regard to the types of *M. Govinda*, Mr. Gurney in a letter to me, dated 5th July, 1872, says, "Many years ago I examined in the Museum of the East India Company the two type specimens from which the late Col. Sykes originally described his *M. Govinda*. One of them appears to me to be identical with the Australian *M. affinis*, the other to be a somewhat larger bird, and I think of the form intermediate between *M. melanotis* and *M. affinis*, if such there really be as a distinct race."

It would appear from the foregoing that there is some difference between the two type birds of *M. Govinda*; and a critical re-examination of them is much to be desired. For my own part, I am not at all satisfied that *Milvus Govinda* is not *Milvus melanotis*.

The original description of Sykes' species is to be found in P. Z. S., 1832, p. 81.

Only two dimensions are given; "Longitudo corporis 26 unc.; and, "caudæ 11." *The former is, I think, fatal against M. Govinda being the bird we now recognize as that species, i. e., the common Calcutta kite.* The following are total lengths of several kites, the sexes of which were carefully ascertained:

|                   |         | inches. |
|-------------------|---------|---------|
| <i>M. major</i> , | ♂ ..... | 25½     |
| " "               | ♀ ..... | 25½     |
| " "               | ♀ ..... | 25¾     |
| " "               | ♀ ..... | 25¼     |
| " "               | ♀ ..... | 24½     |
| " "               | — ..... | 24¼     |

|                   |        |       |            |                                                 |
|-------------------|--------|-------|------------|-------------------------------------------------|
| <i>M. Govinda</i> | ♂      | ..... | 21         |                                                 |
| "                 | "      | ♂     | .....      | 22                                              |
| "                 | "      | ♂     | .....      | 23½                                             |
| "                 | "      | ♂     | .....      | 22½                                             |
| "                 | "      | ♂     | .....      | 22 to 23                                        |
| "                 | "      | ♀     | .....      | 22 to 25                                        |
| M. major,         | ♂ or ♀ | ...   | 27·7 to 29 | } according to Mr. Hume<br>in 'Stray Feathers.' |

From the above dimensions it is apparent that a bird, in the flesh measuring 26 inches, cannot be our common kite. The probability is greatly in favour of its being *M. melanotis*. 26 in. could only be obtained by measuring a stretched skin of our common kite, and this an accomplished naturalist like Col. Sykes would hardly have done.

I have heard that Col. Sykes' types are all carefully packed away in boxes, and it is to be hoped moths' eggs have not been packed up with them. How necessary it is that these valuable types should be in some museum where they might be properly cared for, and accessible. In the British Museum they would be well cared for, and thither they ought to be sent.

There are several of Col. Sykes' types which require re-examination, and especially that of *Sylvia Rama*. Dr. Jerdon was under the impression that the true *S. Rama* was the smaller and more rufous bird separated by Mr. Hume as "*Jerdonia agricolensis*," after examining a series of both birds which I had prepared. The dimensions of Col. Sykes' original description favour Dr. Jerdon's view; for they decidedly indicate the smaller bird. I may mention in passing that the larger bird which Mr. Blyth regarded as *Sylvia Rama*, has been identified by Dr. Tristram with *Sylvia caligata*, Licht.

I have digressed thus from the subject in hand to shew the necessity for Sykes' types being accessible; and I know from experience, that it is a dangerous thing to shut up specimens in the tightest of boxes, unless they have been previously thoroughly baked. The chances are that all these valuable types have been reduced to a confused mass of feathers, or rather of the remains of feathers.

2. *Notes on the Pteropi of India and its Islands, with descriptions of some new or little known species.*—By G. E. DOBSON, B. A., M. B., Staff Surgeon H. M.'s British Forces.

(Abstract.)

According to Drs. Peters' and Gray's lists of the species of *Pteropus* no less than fifty species exist of which half inhabit a few small islands in the Malay Archipelago, and one species only *Pt. medius*, Temm. is known from the Continent of India and Burma.

The writer believes that many of the so-called species which go to make up the large number from Malayana have been founded on insufficient grounds, as several are distinguished solely by the colour of the fur, a most fallacious character in many orders of Mammals, and especially so in the *Chiroptera*. Distinctions based on the shape of the skull and size and form of the teeth are not satisfactory, for it should certainly be possible to determine the species to which a given vertebrate animal belongs without first finding it necessary to kill and make a skeleton of it.

A very valuable character for distinguishing the species of *Pteropi*, as well as other species of *Chiroptera*, is shown to exist in the shape and relative size of the ears, the importance of which has not been sufficiently recognised. This if taken in connection with accurate measurements will, in most cases, if not in all, be found quite sufficient.

*Pt. nicobaricus*, Fitz. et Zel., from the Andaman and Nicobar Islands, is redescribed as it is impossible to recognise the species from the original description in the Zoology of the Novara expedition.\* This species is at once distinguished from *Pt. medius* by the form of its ears which are rounded, not acutely pointed at the tips.

A well-marked variety of *Cynopterus marginatus*, *C. andamanensis*, is described, and *Cynopterus Sherzeri*, Fitz. et Zel. from the Nicobars distinguished from other species of the genus, the original description of this species being quite useless as a means of diagnosis.

A new species of *Cynonycteris* from the Malay Archipelago, *C. minor*, is also described. This species is readily distinguished from *C. amplexicaudatus*, Geoff. by its small ears which are also proportionately much narrower.

Other species of Indian *Pteropi* are redescribed, and a new genus, *Eonycteris*, is established for the reception of *Macroglossus spelæus*, Dobson.

### 3. Description of a new species of *Vespertilio* from the North-Western Himalaya.—By G. E. DOBSON, B. A., M. B.

(Abstract.)

The new species for which the name *Vespertilio murinoides* is proposed, resembles *V. murinus*, L. but is distinguished by its smaller size, by the shape of the ears and tragus which is very acutely pointed, not subacute, as in the latter species, and by the small size of the first upper premolar.

Both papers will appear in the Journal.

### 4. Note on certain species of *Phasmidæ* hitherto referred to the genus *Bacillus*.—By JAMES WOOD-MASON, of Queen's College, Oxford.

The discovery which I have to announce, viz., that the true males of *Bacillus insignis* and its allies are to be sought in insects of the type of

\* Reise der Oester. Freg. 'Novara,' Säugethiere, p. 11.

*Lonchodes Stilpnus*, Westw., *Lonchodes pseudoporus*, Westw. *Lonchodes Russellii*, Bates, &c., affords another instructive illustration not only of the extreme imperfection of our knowledge of this family of Orthopterous Insects, but also of the utter futility of any attempt satisfactorily to distribute the species composing it into genera, until we shall be in possession of the true pairs of many more of the described species.

In 1869 M. Henri de Saussure\* proposed, prematurely as it turns out, to divide the genus *Bacillus* into three subgenera, one (*Bacillus*) for the reception of *B. Rossii* and its allies, another (*Ramulus*) for *B. humilis*, Westw., *B. carinalatus*, Sauss., &c., and a third (*Baculum*) for *B. cunicularis*, Westw., *B. ramosus*, Sauss., &c.; and in the first part of my memoir on the *Phasmidæ*,† I provisionally referred to the last named subgenus one known and three new species, pointing out that these agreed together in having the last dorsal abdominal segment longitudinally grooved, and mentioning, in the description of each species, the presence, in the posterior border of this segment, of an emargination filled by a well-developed supranal plate which is invariably to be found in the females of all species of *Lonchodes*. I have long felt convinced that the insect of which a description is appended, was the male of my *Bacillus* (*Baculum*) *insignis* but have thought it better to wait for evidence confirmatory of the fact. This has, at length, reached me from Ceylon, thanks to Mr. Hugh Nevill, C. C. C., who has been kind enough to send me, amongst other species of great interest and value, the two sexes of an insect agreeing admirably with M. de Saussure's‡ description of *L. pseudoporus*, Westw.

The discovery of the male of *B. insignis* will obviously also necessitate the transference of the following species to the genus *Lonchodes*:—*Bacillus cunicularis* et *Hyphæreon*, Westw. *B. patellifer* et *scytale*, Bates, *B. ramosus*, Sauss., *B. Penthesilea* et *furcillatus*, Wood-Mas.; and I strongly suspect that *B. Westwoodi* et *scabriusculus* will eventually have to follow them to the same genus.

#### LONCHODES INSIGNIS.

♀ *Bacillus* (*Baculum*) *insignis*, Wood-Mason, Journ. A. S. B., Vol. XLII, 1873, pp. 51, 62, pl. V. fig. 1, 2.

♂ Body of excessive tenuity. Antennæ perfectly filiform, 24-jointed, reaching nearly to the apex of the anterior femora. The head is almost a complete miniature of that of the female and in the specimen from which the dimensions given below are taken has two minute tubercles between the eyes representing the well-developed horns of the opposite sex. Three dark dorsal

\* Mém. Orth. Fasc. II, pp. 111, 112.

† Journ. A. S. B., 1873Pt. II, No. I.

‡ Op. cit., pp. 120, 121.

streaks, one median and two lateral, pass along the whole length of the body from the head to the end of the 6th abdominal segment. Both meso- and metathorax are dilated at either end but especially at the insertion of the legs, and have each a raised median dorsal carina. The six basal abdominal segments are slightly expanded at each end, as in spirit specimens of the female; the 7th and 8th are shorter than the preceding, sub-equal, and gradually widen, the former from the base to the apex, the latter from the apex to the base; the last is scarcely longer than these, and cleft for rather more than a third of its length, but the sides of the cleft are so closely approximated that no hiatus is visible as in many other species; seen from the side, this segment terminates in an obtuse, scarcely deflexed tip. The legs are devoid of all traces of the foliaceous lobes so conspicuous in the female, but present the same general structure; the intermediate femora are just perceptibly curved, and the four posterior tibiæ have a few inconspicuous spinules towards the apical end.

Total length, 4 in.  $7\frac{1}{2}$  lin., ant.  $15\frac{1}{2}$ , head 2, proth.  $1\frac{1}{2}$ , mesoth. 12, metath. 11, abd.  $24 + 6 = 30$  lin., ant. legs  $19 + 22 + 6\frac{1}{2} = 4$  in., inter. legs  $12 + 12 + 5 = 2$  in. 5 lin., post. legs  $15 + 16 + 4\frac{1}{2} = 3$  in.

Hab. Samagooting, Naga Hills, with the female. Collected by Captain Butler.

The author exhibited the specimens referred to in the preceding note, and also invited the attention of the meeting to the following fine series of Australian insects belonging to the same family:

*Lonchodes*, n. sp., ♂ ♀. Hab. N. Queensland.

*Lopophus coccophagus*, G. R. Gray, ♂. Hab. Samoa.

*Cyphocrania Goliath*, Gray, ♀.

*Cyphocrania Enceladus*, Gray, ♂ ♀.

*Acrophylla violascens*, Leach, ♂ ♀.

*Podacanthus Typhon*, Gray, ♂ Hab. Champion Bay, N. W. Australia.

*Podacanthus viridiroseus*, Curtis, ♀.

*Tropidoderus Childreni*, Gray, ♂ ♀ et. ♀ var.

*Extatosoma tiaratum*, MacLeay, ♂ ♀ et larva.

The reading of the following papers was postponed.

1. Authorities for the History of the Portuguese in India. By T. W. H. Tolbort, Esq., C. S.

2. Note on two copper-plate grants of Govinda Chandra of Kanouj. By Bábu Rájendralála Mitra.

## LIBRARY.

The following additions have been made to the Library, since the meeting held in June, last.

*Presentations.*

••• Names of Donors in Capitals.

Monatsbericht, January, 1873.

Schott—Einige Zusätze und Verbesserungen zu seiner Abhandlung über die ächten Kirgisen. Borchardt—Untersuchungen über die Elasticität fester isotroper Körper unter Berücksichtigung der Wärme. Dove—Die meteorologischen Unterschiede der Nordhälfte und Südhälfte der Erde.

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN.

Bulletin, April, 1873.

E. G. Rey—Essai géographique sur le nord de la Syrie. Khiva. (Extrait d'un travail du Colonel Venioukof.)

THE GEOGRAPHICAL SOCIETY OF PARIS.

Actes, 3<sup>e</sup> Ser., 33<sup>e</sup> Année—1871-72.

M. Linder—Discours sur l'origine des aurores polaires.

THE NATIONAL ACADEMY OF SCIENCES AND ARTS OF BORDEAUX.

Zamidar-o-Prajá, (a Bengali pamphlet on the relations of landlord and tenant). By Nilakamala Mukerji.

THE AUTHOR.

Professional Papers on Indian Engineering, May, 1873.

A. Nelly—Report on experiments made on Kankar Mortars and Concrete. E. A. Sibold—Retrogression of level in canals. W. W. Culcheth—Quantity of water for various crops. Captain A. Cunningham—Transverse strain in pillars. Major H. Tulloch—Masonry conduits versus Iron pipes. Major H. Tulloch—History of the water supply of Bombay.

THE EDITOR.

The Calcutta Journal of Medicine, March and April, 1873.

THE EDITOR.

The Christian Spectator, Vol. II, No. 24.

THE EDITOR.

Rámáyana, Vol. 3, No. 7.

THE EDITOR.

Vetála Panchavinshati.

BABU RA'JENDRALA'LA MITRA.

Memorandum on the Metals and Minerals of Upper Burmah. By Captain G. A. Strover.

The Flora Sylvatica, part XXVI, by Major R. H. Beddome.

Kitab-ul-Twazih fi Asú-lil-Ashri, (Human Anatomy in Arabic).

THE GOVERNMENT OF INDIA.

Palæontologia Indica, Vol. I, Part 1. Jurassic Fauna of Kutch.

W. Waagen—The Cephalopoda (Belemnitidæ and Nautilidæ).

THE GEOLOGICAL SURVEY OF INDIA.

*Purchase.*

The Indian Antiquary, June, 1873.

L. Rice—Nágamangala Copper-plate Inscription. W. Ramsay—Sapta Sringa. Capt. S. B. Miles—Archæological remains in Mekran. Dr. Bühler—On a Prakita Glossary entitled Paiyalachhi. Rev. F. Kittel—Coorg Superstitions. W. F. Sinclair—Notes on Natural History. Dinshah Ardeshir Taleyarkhan—Legend of Vellur. Three Copper-plate grants from the Krishna district. Archæology of Belári district.

*Exchange.*

Nature, Nos. 184-187.

PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR AUGUST, 1873.

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The Monthly General Meeting of the Society was held on Wednesday, the 6th instant, at 9 o'clock P. M.

Col. H. Hyde, R. E., President, in the chair.

The minutes of the last meeting were read and confirmed.

The following presentations were laid on the table—

1. From the Government of India—

A copy of "Report of a Tour made by Captain Miles to Kedj and Punjoor and his return *via* Kurrachi."

A copy each of *Æsop's Fables* and the Gospel of St. Luke, translated into the Swaheli language by Dr. Steere, Zanzibar.

A copy of a "Diary of a Journey from Bunder Abbas to Baghdad, *via* Seistan, Meshed and Teheran" by Mr. G. Rozario, late in medical charge of the Seistan Mission.

2. From the Imperial Government of Brazil—A copy of a work entitled "Climat, Géologie, Faune, et Géographie Botanique du Brésil," by Mr. E. Liais.

3. From the Directors of the Batavian Society of Arts and Sciences two copies of "Photographien naar Oudheden van Java, door J. van Kinsbergen."

The following letter accompanied the donation—

'We have the pleasure to inform you that through the Netherlands India Steam Navigation Company we have forwarded to the address of your Society, as per enclosed bill of lading, a case containing a collection of photographs representing part of the antiquities of Java.

'In the 33rd volume of the Transactions of our Society will be found an elaborate monograph on Hinduism in Java, a posthumous work of the Rev. J. F. G. Brumund, Protestant Minister at Batavia, who, at the suggestion of



our Society, was entrusted by the Government of Netherlandish India with the task of visiting and describing the remains of the Hindu period, but who unfortunately was prevented by his untimely decease from accomplishing his studies, leaving unfinished a work which, when completed, would unquestionably have become one of the most interesting sources of our knowledge of the pre-Mahomedan period of Java.

‘Together with the proposal of our Direction to entrust to the Rev. J. F. G. Brumund the description of the various monuments, we called the attention of the India Government to the necessity of having the monuments, at least the most interesting of them, reproduced by an able photographer, and according to our advice, Government made choice of Mr. v. Kinsbergen, who under our control and according to our instructions has been occupied for some years in forming the collection of which a copy is now presented to your learned Society through our instructions, but in the name of the Government of Netherlandish India.

‘The photographs are accompanied by a catalogue from which you will please to observe that only the smaller part of them has been described in the above quoted work of Mr. Brumund, a new copy of which will be found in the parcel, containing the latest publications of our Society, which we have at the same time forwarded to your address.

‘Nearly all the antiquities that have been found in the Residencies of Bagelen, Gidiri, &c., were photographed after the death of Mr. Brumund, and till now our endeavours to find a person capable of continuing the labours of our lamented colleague, have been unsuccessful. On the other hand however, Mr. v. Kinsbergen has again been commissioned by Government to complete the present collection of photographs by reproducing in detail that most splendid monument in the residency of Kadæ known to all students of Hindu art and history under the widespread name of the Boro Boedoer.

‘Some more remnants of the earlier period of history in that part of Java will be added to the collection, and through the liberality of our Government, the learned world in Europe will in a couple of years have at their disposal a nearly complete representation of the most remarkable remains of the Hindu period, which have escaped the mutilating hand of man, and the destructive influence of time and climate.’

The President drew the attention of the meeting to the unusually valuable and interesting nature of this fine collection of photographs and proposed a vote of thanks to the Batavian Society of Arts and Sciences.

Mr. Blochmann seconded the proposal, and it was carried unanimously.

4. From the French Minister of Marine, Paris.—A copy of “*Voyage d’Exploration en Indo-Chine*,” by M. M. de Lagrée and Garnier.

A vote of thanks to the French Department of Marine for this splendid work, proposed by the President, seconded by Mr. Blochmann, was carried unanimously.

Mr. Blochmann exhibited the following two coins forwarded to him for exhibition by the Rev. Mr. Carleton, Rúpar.

1. A *Qusbuddín Mubaraksháhi*, silver and copper. New variety. Square. Weight, 83.386 grains. A. H. 719.

OBVERSE.—*الامام الاعظم قطب الدنيا و الدين ابو المظفر* ۷۱۹

REVERSE.—In a small circle *مبارك شاه خليفة الله*

and along the four sides—*سلطان الواثق بالله امير المؤمنين*

Similar coins were published by Mr. Thomas, 'Chronicles,' pp. 179 to 183.

2. A coin struck by *Mu'izzuddín Mubarak Sháh*. Silver. New variety. Round. Weight, 74.812 grains. A. H. 833.

OBVERSE.—*السلطان الاعظم . . مبارک شاه خلد الله ملكه و سلطانہ* ۸۳۳

and in a small square, inserted into the middle the second line *وارنه*—whatever these words may mean.

REVERSE.—Within a square, the *Kalimah*. The square is inscribed in a lozenge, and the four spaces between the sides of the square and sides of the lozenge contain the names of the four Khalifas. In the first line of the obverse, the coin has a punch mark. *Vide* Thomas, 'Chronicles,' p. 333.

A letter was read from the Rev. Mr. Erhardt, Superintendent of the Secundra Orphanage, in reply to a letter of the Secretary, written in compliance with the resolution passed at the general meeting in June, asking for further information as to the fact of the finding of certain children in the company of wolves. Mr. Erhardt gave no new facts, but stated his very strong belief of one of the children referred to having been burnt out of a wolves' den, such belief being founded on the extremely animal-like and filthy propensities of the child when brought to the asylum, the recent burns on his person and the testimony of the persons who brought him.

The following gentlemen duly proposed and seconded, were balloted for and elected ordinary members.

J. C. Parker, Esq.

W. J. Olpherts, Esq.

Lieut. C. T. Bingham.

Kumára Grischandra Sinha Bahádur.

Bábu Jogeshchandra Dutt.

Alexander Pedler, Esq.

Col. W. E. Marshall.

W. G. Bligh, Esq.

Capt. W. F. Badgley.

Lieut. R. G. Woodthorpe, R. E.

D. D. Cunningham, Esq., M. B.

Capt. J. Butler, (re-elected).

Mr. E. Van Cutsem has intimated his desire to withdraw from the Society.

Mr. H. Blochmann exhibited rubbings of the following inscriptions received from General A. Cunningham, C. S. I., in continuation of the rubbings shewn at the last meeting.

### Rápri'.

#### *The 'Aláuddín Khilji Inscription of the 'Idgáh at Rápri.*

بناء این بقعہ شریف بتوفیق یزدانی و تأیید سبحانی و بفضل ربانی در عهد  
خلافہ مکندر الثاني علاء الدین المخصوص بعنایت رب العالمین ابو المظفر  
محمد شاه السلطان ناصر امیر المومنین و نوبت ایالت بندہ کترین خدایگانی کافر  
سلطانی تقبل الله منهم و احسن الله جزاءهم فی المنصف من شهر المبارک  
رمضان عظم الله حرمتہ سنہ احدى عشر و سبعماية ॥

The building of this noble work [took place] by the grace of God and the assistance of the Almighty and the favour of the Lord, during the time of the reign of the second Alexander, 'Aláuddunyá waddín, who is distinguished by the kindness of the Lord of the worlds, Abul Muza'far Muhammad Sháh, the king, the helper of the Commander of the Faithful, and during the governorship of the mean slave of his Majesty, Káfúr, the Royal—may God accept it from them, and may God give them an excellent reward! In the middle of the blessed month of Ramazán (may God increase its honor!) of the year 711. [End of February, 1312, A. D.]

The tablet measures 5 feet by 2 feet, and consists of four lines. The letters are thick and clumsy.

The inscription refers to the end of 711, when Malik Káfúr came back to Diblí laden with the treasures of Malabar and Dhúr Samundar.

Rápri is often mentioned in early Muhammadan history. It lies S. E. of Ágrah, on the left bank of the Jamuná, opposite to Batesar. It is now in ruins, the chief town of the Parganah being Shikohábád (named after Dará Shikoh).

### Mahoba'.

Mahobá lies near the southern boundary of the N. W. Provinces, halfway between Kánpúr and Ságar.

During the Muhammadan rule it belonged to Sirkár Kálinjar, and was famous for its excellent betel leaves, of which it had annually to furnish 120,000. During the reign of Fírúz Sháh (III) it was for a long time the jágir of Naçír Khán, and after him that of his son Sulaimán (A. H. 781, or A. D. 1379). *Badáoní*, I, 251.

#### *The Ghiyásuddín Tughluq Inscription on the Mosque of Mahobá.*

بفضل ایزدی آمد بشارت کہ مسجد در مہوبا شد عمارت  
بعہد پادشاہی وقت اقلیم مدار المملکت ملجائی اسلام  
غیاث الدین و دنیا دومین جم فلک درگاہ تغلق شاہ عالم

جهاندارے کہ زخم گرز و خنجر شدش ضبط ممالک چون سکندر  
 فاکسان در زمانہ مہریان باد بگیتی تختِ مملکت جاودان باد  
 کمینہ بند شامی نکونام کہ شد در نوشتش مسجد با تمام  
 ملک تاج الدول بابخت سرمد محمد خلق نیکو اسم احمد  
 .. .. . بسلك عون یزدان درکشیدہ  
 چو بر مقصد فزون شد بست و دو زاست در و دیوار محسن مسجد آراست  
 زہجرت در ربیع آخرین بود کہ دست نیک در بنیاد این بود

1. By the favour of God the good news arrived that the Mosque had been built at Mahobá,
2. During the reign of the king of the seven zones, the centre of royalty, the asylum of Islám,
3. Ghiyás uddunyá waddín, a second Jam, whose throne is (as high as) the heaven, Tughluq, the king of the world,
4. A king who, like Alexander, by the force of his club and sword, conquered countries.
5. May he, like the heaven, be kind in his reign, and may the throne of his kingdom be everlasting in the world!
6. A mean slave of the famous king, in whose reign the mosque was completed,
7. Malik Tájuddaulah, the fortunate, mild as Muhammad, whose excellent name is Ahmad.
8. Has with the help of God \* \* \* (illegible)
9. When twenty-two years had passed beyond 700, he built the door, the wall, and the courtyard of the mosque.
10. It was in Rabí 'II. of the Hijrat, that his kind hand was engaged in building this edifice.

Thus the mosque was built by Malik Tájuddín Ahmad, in Rabí' II, 722, A. H., or May, 1322, A. D.

An imperfect reading of this inscription, together with two modern inscriptions from the Hamírpur District, were some time ago received by the Society from Mr. E. T. Atkinson, C. S. The first of the modern ones refers to the building of a Mosque and the digging of a well by one Khwájah Firúz during the reign of Aurangzib, but the reading is not metrical. The second inscription is (metre, *khaṣṣīf*)—

در زمان خدیو عالمگیر کنده شد چه چو چشمه حیوان  
 قلعه بے آب بود زن سالش عقل گفت آب داد حاتم خان

1. In the reign of 'A'lamgír, the king, this well, which is like the water of life, was dug.
2. The Fort was without water. Genius, therefore, said that the date was given in the words 'Ab dáḍ Hátim Khán,' 'Hátim Khán procured water.'

This gives A. H. 1113, or A. D. 1701.

## Dihli.

1. *The Firúz Sháh Inscription of 753 A. H.*

قال رسول الله صلى الله عليه وسلم إذا رايتم الرجل يتعاهد المسجد فاشهدوا  
اليه بالإيمان فإن الله يقول إنما يعمر مساجد الله من آمن بالله واليوم الآخر. بناء  
ابن مسجد در عهد دولت سلطان اعظم قهرمان معظم الوائق بتأييد الرحمن ابو  
المظفر فيروز شاه السلطان خلد الله ملكه و سلطانه بانى ابن خير بندۀ اميدوار  
برحمت پروردگار بهادر مولی مؤلفي امير المؤمنين المدعو بشار خان تقبل الله منه  
في الغرة من رمضان سنة ثلث وخمسين وسبعماية ॥

The Prophet of God—may God's blessings rest on him!—says, "If you see that the man pledges himself to the mosque, testify in his favour; for God says, 'Surely he who believes in God and the last day, will build the mosques of God.' [Qorán.]

The building of this mosque [took place] in the time of the reign of the great Sultán, the exalted sovereign, who trusts in the help of the Almighty, Abul Muzaffar Firúz Sháh, the king,—may God perpetuate his kingdom and rule! The builder of this religious edifice is the slave who hopes in God's mercy, Bahádur Maulá, the freed slave (mauld) of the Commander of the Faithful, who is called Nisár Khán—may God accept it of him! On the first day of Ramazán, 753. [11th October, 1352.]

The inscription measures about 4½ feet by 2 feet, and consists of four lines without the usual bars between the lines. The letters are clumsy, and there are no diacritical points. Hence my reading of the name of the builder 'Nisár Khán' is somewhat doubtful.

The inscription is of interest as it belongs to the very beginning of Firúz Sháh's reign.

2. *The Sikandar Sháh Inscription of 900 A. H.*

بسم الله الرحمن الرحيم

قال الله تبارك وتعالى و ان المساجد لله فلا تدعوا مع الله احدا عمارت ابن  
بقعة شريف در عهد سلطان السلاطين بادشاه ربع مسكون برگزیدۀ حضرت كن فيكون  
الواثق بالتأييد الرحمن ابو المظفر سكندر شاه بن بهلول شاه سلطان كاله خلد الله  
ملكه و سلطانه و اعلى امره و شانه در عمارت مسجد جامع بوع (؟) بناكردۀ مغفور  
مرحوم ابو امجد \* \* \* و تاريخ غرة صاع ربيع الاول سنة تسعمائة ॥

God who is blessed and exalted has said, "Surely the mosques belong to God, do not call on any one else besides God" [Qorán]. The building of this excellent work of piety [took place] during the reign of the king of kings, the ruler of the inhabited quarter of the world, the chosen of the Lord who said 'Let there be,' and it was, who trusts in the assistance of the All-merciful, Abul Muzaffar Sikandar Sháh, son of Buhlúl Sháh, Sultán Káláh—may God perpetuate his kingdom and rule and elevate his condition and dignity! This door of the building of the Jámi' Masjid [one word without meaning] was erected by the pardoned, deceased Abú Amjad \* \* \* [illegible]. Dated 1st Rabi' I, 900. [30th November, 1494].

This inscription contains nine lines, separated by the usual bars, and looks more like a headstone than a mosque inscription.

3. *Inscription from the tomb of one Daulat Khán (A. H. 920).*

در عهد همايون سلطان الاعظم المعظم المتوكل على الرحمن سكندر شاه بن  
بهلول شاه سلطان خلد الله ملكه وملكاته بنا كرد اين گنبد هندو اعيانوار بر حمت  
پروردگار دولت خان \*\*\* خواجه محمد غفر ماہ رجب سنه عشرين و تسعمائة //

In the auspicious reign of the great exalted Sulṭán, who trusts in the All-merciful, Sikandar Sháh, son of Buhlál Sháh, the king,—may God perpetuate his kingdom and rule!—this vault was built by the slave who hopes in the mercy of the Creator, Daulat Khán \*\*\* Khwájah Muhammad. 1st Rajab, 920. [23rd August, 1514.].

Mr. T. W. Beale, of Partábpúrah, Ágrah, the learned author of the *Miftáh uttawárikh*, has sent the following readings of inscriptions.

1. Biánah.

"There is a place of worship of the Hindús, about  $1\frac{1}{2}$  kos from the Qaçbah of Biánah, in the district of Bhartpúr, called "Barmádh Mátá." In the 7th year of Jahángír (1022 A. H.), Maryam Zamání (مریم زمانی), the daughter of Rájá Bihári or Bhárá Mal and mother of Jahángír, caused a garden and a Báolí (a well with steps) to be built there, which cost her 20,000 Rs. At present, there is no sign of the garden, but the building which is over the Báolí still exists. It is built with red stone and has the following inscription on a slab of marble."

|                           |                             |
|---------------------------|-----------------------------|
| بعد شاه نور الدین جهانگیر | جهان شد گلشن از مه نا بمانی |
| بحکم مادرش مریم زمانی     | کزو تابنده شد نور الهی      |
| مرتب گشت باغ و باواری خوش | ز شرمش خلد را شد چهره کافی  |
| خرد گشت از پی تاریخ تعمیر | سنه هفت جلوس پادشاهی        |

1022

1. In the reign of the king N ú r u d d í n J a h á n g í r, the world became a rose-bed, from the moon to the fish.

2. By order of his mother M a r y a m Z a m á n í, from whom the divine light shone forth,

3. This garden and this well were nicely built, so much so, that from shame the face of Paradise got pale.

4. Genius expressed the date of the building in the words, 'The 7th year of the Imperial accession.' [A. H. 1022, or A. D. 1613.]

The phrase 'from the moon to the fish' is often used by poets, and is an allusion the old belief that the earth rests upon a fish; hence 'from the moon to the fish' means 'the whole earth.'

2. Ajmír.

"Jahángír writes in the Tuzuk i Jahángiri, that there is a large tank in Ajmír, and that when he visited the place in 1024 A. H., he named it

"Chashmah i Núr" ('Fountain of light') after his own name Núruddín, and ordered a building to be erected on its banks, which is still standing. The following inscription is to be seen at the top of the building, which shows the year of its erection, 1024 A. H."

بلند اقبال شاه هفت کشور • که وصف او نمیکند به تقریر  
 فروغ خاندان شاه اکبر • شهنشاه زمان شاه جهانگیر  
 درین سرچشمه چون آمد ز فیض • روان شد آب و خاکش گشت انیس  
 شهنشاه کرد نامش چشمه نور • شده آب خضرزان چاشنی گیر  
 دهم سال از جلوس شاه غازی • بحکم پادشاه نیک ندبیر  
 بطرف چشمه نور این عملت • جهان آرای شد از روی نقدیر  
 خرد تاریخ انعامش رقم کرد • محل شاه نورالدین جهانگیر

۱۰۲۴

1. When the fortunate king of the seven realms, whose praise cannot be expressed in writing,—

2. The light of the house of Sháh Akbar, the sovereign of the time, Sháh Jahángír,—

3. Came to this spring, the water flowed in consequence of his liberality, and its soil became the elixir of life.

4. The king named it 'Fountain of Light,' and Khizr's water [the water of life] derives its taste from it.

5. In the 10th year of the accession of the victorious king, by order of the well-meaning ruler,

6. This building at the side of the 'Fountain of Light' became, by the decree of fate, an ornament of the world.

7. Genius expressed the date of its completion in the words, 'the Mahall of Sháh Núruddín Jahángír.' A. H. 1024 [A. D. 1615].

### 3. A'grah.

The following is the Táríkh of the famous Ismá'íl Beg, who was imprisoned by the Maráthas in the Fort of A'grah in the time of the blind emperor Sháh 'Alam, and died there in the year 1214, A. H. His tomb is still to be seen at A'grah, bearing the following inscription—

احتشام الدوله اسمعیل خان • چونکه رحلت کرد در دارالجنان  
 گفت هائف سال تاریخش ز غیب • که صاحب شوکنه شد از جهان

۱۲۱۴

1. When Ihtishám uddaulah Ismá'íl Khán left for Paradise,

2. A voice from heaven expressed the date of his death in the words 'Alas, a great man has gone from this world.' A. H. 1214 [A. D. 1799-1800].

Regarding Ismá'íl Beg, *vide* Keene's History of the Mogul Empire, Book II, Chapter V.

The following papers were read—

1. *Authorities for the History of the Portuguese in India.*—By  
T. W. H. TOLBORT, B. C. S., *Miyánwáli, Bannú.*  
(Abstract.)

Mr. Tolbort gives in this paper a list of the authors whose works are most valuable for the History of the Portuguese in India. He limits the range of these authorities to the period between 1493 when Vasco da Gama discovered India, and 1663 when the capture of Cochin by the Dutch finally broke the power of the Portuguese, and established the supremacy of others in the East. During that period the adventures of the Portuguese form a chapter of Universal History. In years subsequent to 1663, the subject, though not devoid of incidents of gallantry and romance, dwindles to one of national rather than universal interest.

The oldest work is by Correa, who came in 1512 as amannensis to Albuquerque to India. Then follow João de Barros (died 1570), whose 'Da Asia' is looked upon as a classical work, and Couto, the continuator of De Barros, after whom the works of many other authors are described.

The author also gives references to Muhammadan writers, and notices in conclusion the Dutch and Portuguese records that still exist at Goa and other settlements, selections from which were printed between 1866 and 1869 by Sr. Rivara of Goa.

2. *Notes on two Copper-plate Grants of Govindachandra of Kanouj.*—By  
BA'BU RA'JENDRALA'LA MITRA.

The two copper plates, which form the subject of the paper, were lately discovered in the village of Basáhi in the Etawah district, and sent for notice by Mr. E. T. Atkinson, B. C. S. One of them bears date Samvat 1161 = A. D. 1103, and the other 1174. Both record grants of villages to Bráhmans by Rájá Govindachandra Deva of Kanouj. The paper gives a summary of the dates of the last line of Kanouj kings from Yasovigraha to Jayachandra, the last sovereign, from whom the country passed into the hands of Moslim rulers; and notices a number of taxes and cesses which zemindars were authorized to impose on the people, including among others, a chowkidary tax, a tax on justice, a percentage on mortgages, and cesses on mines, salt-pits, mowa and mango trees, khaskhas grass, and trade in precious metals. Annexed to the paper are transcripts and translations of the two records.

3. *On a new genus and species (Hylæocarcinus Humei) of Land Crabs from the Nicobar Islands.*—By J. WOOD-MASON.

The species described in this paper is very closely allied to the members of the West Indian and Brazilian genera, *Gecarcinus* and *Pelocarcinus*, but



differs from both in that the infra-orbital lobe is not united to the front. The external maxillipeds are similar in form to those of the latter but in the mode of insertion of the three terminal joints of these appendages *Hylæocarcinus* differs from both genera, forming a transition from the one to the other: in *Gecarcinus* the third joint completely hides the terminal ones which are inserted on its inner face; in *Hylæocarcinus* it hides all but the external edge of the first of these joints: and in *Pelocarcinus* these joints are inserted at the middle of its anterior margin and are completely uncovered. In *Hylæocarcinus*, as in its New World allies, the dactylopodites of the ambulatory legs are armed with six rows of spines.

A male and a female were taken by the author on Treis Island, Nicobars, and another male by Mr. A. O. Hume, C. B., on Narcondam Island, Andamans.

The paper will appear in the next number of the Journal.

4. *Descriptions of new species of Unionida.*—By W. THEOBALD.

This paper will appear in Part II, No. 4, of the Journal.

Dr. Waldie made the following brief remarks on some investigations he was engaged in, regarding the filtration of the water of the river Hughli during the rainy season—

The filtering operations at Palta for the water supply of Calcutta have, during the rainy season, been attended with great trouble and difficulty, and remedies had been proposed for this based upon experience in water filtration in England. He, the speaker, however, who had long been acquainted with the difficulty, had always maintained that it arose from a peculiarity in the water itself, and that conclusions drawn from experience with English river water were not applicable to the case. Hitherto he had not been able to support his view otherwise than by arguments drawn from the difference of circumstances in the two cases and by the actual facts observed in the filtration. A few days ago a new idea occurred to him by which he thought it probable that the nature of the peculiarity of the water might be explained, which he had immediately put to the test of experiment, and with such a satisfactory result that he intended to follow it up, and would, with permission, bring it before the Society at the first opportunity. The title of the proposed communication would probably be, "An experimental enquiry into the characteristics of the muddy water of the Hughli during the rainy season, with reference to its purification."

The President announced that there would be a recess of two months and that the next meeting would be held in the month of November.

## LIBRARY.

The following additions have been made to the Library since the meeting held in July last.

*Presentations.*

## \*\*\* Names of Donors in Capitals.

Royal Society, Proceedings, Nos. 139-143.

No. 139. *A. Rattray*—Further experiments on the more important Physiological Changes induced in the Human Economy by Change of Climate. *A. Ransome*—On the mechanical conditions of the Respiratory Movements in Man.

No. 140. *E. Ray Lankester*—A contribution to the knowledge of Hæmoglobin. *J. Norman Lockyer*—Researches in Spectrum-Analysis in connexion with the spectrum of the Sun.

No. 141. *J. N. Lockyer* and *G. M. Seabrooke*—On a new method of viewing the Chromosphere. *R. J. Lee*—Further remarks on the Sense of Sight in Birds. *W. Huggins*—Note on the Wide-slit Method of viewing the Solar Prominences. *Professor Owen*—On the Fossil Mammals of Australia, family *Macropodidæ*. *H. C. Bastian*—Note on the origin of Bacteria and on their relation to the process of Putrefaction.

No. 142. *Dr. W. Kowalevsky*—On the Osteology of the *Hyopotamidae*. *F. Guthrie*—On a new relation between Heat and Electricity. *H. N. Moseley*—On the Anatomy and Histology of the Land-Planarians of Ceylon, with some account of their habits, and a description of two new species, and with notes on the Anatomy of some European Aquatic species. *H. Airy*—On Leaf-arrangement.

No. 143. *Rudolph von Willemoes-suhm*—On a new Genus of Amphipod Crustaceans. *J. D. Macdonald*—On the Distribution of the Invertebrata in relation to the theory of Evolution. *H. C. Bastian*—On the temperature at which Bacteria, Vibriones, and their supposed Germs are killed when immersed in fluids or exposed to heat in a moist stato. *The Earl of Ross*—The Bakerian Lecture: On the Radiation of Heat from the Moon, the Law of its Absorption by our atmosphere and its variation in amount with her Phases. *E. A. Schäffer*—On the structure of striped Muscular Fibre. *Sir B. C. Brodie*—Note on the synthesis of Marsh-Gas and Formic Acid and on the Electric Decomposition of Carbonic Oxide. *J. H. Gladstone* and *A. Tribe*—On an Air-Battery.

Philosophical Transactions, Vol. 161, part II, and Vol. 162, part I.

Vol. 161, Part II. *General Sir E. Sabine*—Records of the Magnetic Phenomena at the Kew Observatory. Analysis of the Principal Disturbances shown by the Horizontal and Vertical Force Magnetometers of the Kew Observatory from 1859 to 1864. *Archdeacon Pratt*—On the constitution of the Solid Crust of the Earth. *N. Story-Maskelyne*—On the Mineral Constituents of Meteorites. *H. E. Roscoe*—On the Measurement of the Chemical Intensity of Total Daylight made at Catania during the Total Eclipse of December 22nd, 1870. *W. C. Williamson*—On the Organization of Fossil Plants of the Coal-measures: Calamites. *A. Günther*—Description of *Ceratodus*, a genus of Ganoid Fishes, recently discovered in the rivers of Queensland, Australia.

Vol. 162, Part I—*E. G. Stone*—An experimental determination of the Velocity of Sound. *P. M. Duncan*—On the structure and affinities of *Guyana annulata*, Duno. with remarks upon the persistence of Palæozoic Types of *Madreporaria*. *A. Macalister*—The Myology of the Cheiroptera. *W. C. Williamson*—On the organization of the Fossil Plants of the Coal-measures: Lycopodiaceæ, Lepidodendra, and Sigillariæ.

Catalogue of Scientific Papers compiled and published by the Royal Society of London, Vol. VI. (1800-1863).

THE ROYAL SOCIETY OF LONDON.

Zoological Society of London, Proceedings, 1872, March-June.

*J. Anderson*—On some Persian, Himalayan and other Reptiles. *E. W. H. Holdsworth*—Catalogue of Birds found in Ceylon, with some remarks on their habits and local distribution and description of two new species peculiar to the Island. *W. E. Brooks*—On the Imperial Eagles of India. *Dr. J. E. Gray*—On the Genus *Chelymys* and its allies from Australia. *Major H. H. Godwin-Austen*—Description of new Land and Fresh-water shells from the Khasi, N. Cachar and Naga Hills. *Sir V. Brooke*—On *Hydropotes inermis* and its Cranial characters as compared with those of *Moschus moschiferus*. *A. H. Garrod*—On the Mechanism of the Gizzard in Birds. *J. Anderson*—On a supposed new Monkey from the Sunderbans to the East of Calcutta. *R. Swinhoe*—Descriptions of two new Pheasants and a new *Garrulus* from Ningpo, China. *F. Moore*—Descriptions of new Indian Lepidoptera. *E. W. H. Holdsworth*—Note on a Cetacean observed on the west Coast of Ceylon. *A. Günther*—On the Reptiles and Amphibians of Borneo. *Viscount Walden*—Notice of an appendix to his memoir on the birds of Celebes. *A. Anderson*—Additional notes on the Raptorial Birds of North-Western India. *S. J. Bowerbank*—Contributions to a general history of the *Spongiadae*. *Capt T. Hutton*—On the Bats of the North-Western Himalayas. *Dr. J. Murie*—On the Indian Wild Dog. Observations on the Macaques, I. The Bornean Ape. On the Cranial Appendages and Wattles of the Horned Tragopan.

Index to the Proceedings, 1861-70.

Transactions, Vol. VIII, Part 3.

THE ZOOLOGICAL SOCIETY OF LONDON.

Geological Society of London, Journal, No. 113, February, 1873.

*H. Woodward*—On Eocene Crustacea from Portsmouth.

THE GEOLOGICAL SOCIETY OF LONDON.

Chemical Society of London, Journal, November 1872, to April 1873, with Supplementary Number containing Index and Title-page to Vol. X.

Novr. 1872. *Professor Cannizzaro*—Considerations on some points of Theoretic Teaching of Chemistry.

Sept. 1873. *W. C. Roberts*—On the condition of the Hydrogen occluded by Palladium, as indicated by the Specific Heat of the Charged Metal. *W. H. Hartley*—On the Standardising of Acids. *E. Nicholson*—Analysis of the water of the Mahanuddy.

THE CHEMICAL SOCIETY OF LONDON.

The Statistical Society, Journal, 1872, Parts III—IV.

*H. Joule*—Some statistics relating to the Traffic through the Suez Canal.

THE STATISTICAL SOCIETY OF LONDON.

Royal Geographical Society, Proceedings, Vol. XVI, No. 5, Vol. XVII, No. 1.

Vol. XVI, No. 5. *Shaw*—Central Asia in 1872. *Strachey*—The Scope of Scientific Geography.

Vol. XVI. No. 1. *Godwin-Austen*—The Garo Hills. *Macdonald, Tanner, Badgley*—The Lushai Expedition.

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

The Royal Asiatic Society, Journal, Vol. VI, Part II.

*James Fergusson*—On Hionen-Thsang's Journey from Patna to Ballabhi, and note on the same. *Col. H. Yule*—Northern Buddhism.—Hwen Thsang's account of the Principalities of Tokharistan. *Dr. H. Kern*—The Brhat Sanhitā. *E. Thomas*.—The Initial Coinage of Bengal. *S. Beal*—The Legend of Dipankara Buddha.

THE ROYAL ASIATIC SOCIETY OF GREAT BRITAIN AND IRELAND.

Royal Institution, Proceedings, Vol. VI, Parts V-VI.

No. 56. *Professor Tyndall*—On the Identity of Light and Latent Heat. *Dr. Gladstone*—On the Crystallization of Silver, Gold and other Metals. *C. W. Siemens*—On measuring Temperatures by Electricity. *S. Evans*—On the Alphabet and its origin.

No. 57. *J. N. Lockyer*—On the Eclipse Expedition of 1871.—*A. V. Harcourt*—On the Sulphurous impurity in Coal Gas. *N. Story-Maskelyne*—On Meteoric Stones. *Prof. Abel*—On the more important Substitutes for Gunpowder. *Prof. Odling*—On the History of Ozoue.

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Institution of Civil Engineers, Minutes of Proceedings, Vols. 3, 4, 6-17, 19-34.

Catalogue of the Library, 2 Vols.

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THE INSTITUTION OF CIVIL ENGINEERS, LONDON.

Birmingham Institution of Mechanical Engineers, Proceedings, January, 1873.

*W. Baines*—Description of an improved apparatus for working and interlocking Railway Signals and Points.

THE INSTITUTION OF MECHANICAL ENGINEERS, BIRMINGHAM.

Royal Society of Edinburgh, Proceedings, 1871-72.

*E. Sang*—On the Computation of the Strength of the Parts of Skeleton or Open Structures. *Professor Tait*—Laboratory notes: on Thermo-Electricity. *D. H. Marshall*—On the relation of Magnetism to Temperature. *Professor Tait*—Note on a singular property of the Retina. *W. J. M. Rankine*—On the Decomposition of Forces Externally applied to an Elastic Solid. *Professor W. Thomson*—Notice of a new family of the Echinodermata. *Professor Tait*—Address on Thermo-Electricity. *Professor W. Thomson*—On the Crinoids of the "Porcupine" Deep-sea Dredging Expedition.

Transactions, Vol. XXVI, Part IV.

*J. A. Brough*—On the Lunar diurnal Variation of Magnetic Declination at Travandrum, near the Magnetic Equator, deduced from Observations made in the Observatory of His Highness the Maharajah of Travancore. *J. H. Balfour*—Remarks on the Ipecacuanha Plant as cultivated in the Royal Botanic Garden, Edinburgh, with a memorandum as to the mode of transmitting specimens to India.

THE ROYAL SOCIETY OF EDINBURGH.

Journal Asiatique, 6me Série, No. 74, (Index to the sixth series, comprising the years 1863-72) ; and 7me Série, Vol. I, Nos. 1. 2.

M. Feer—Études Bouddhiques. M. S. Guyard—'Abd ar-Razzâq et son traité de la prédestination et du libre arbitre.

THE ASIATIC SOCIETY OF PARIS.

Anthropological Society of Paris, Bulletins, 11me Série, Tome VII, Fasc. 1—4 (Jan. to June.)

Rousselot—Sur les Français du royaume de Bhopal.—Sur un négritto des forêts de l'Inde Centrale.

THE ANTHROPOLOGICAL SOCIETY OF PARIS.

Bulletin, 1873, Mai.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Royal Prussian Academy of Sciences, Monatsbericht, 1873, No. 1.

Abhandlungen, 1871.

Ehrenberg.—Uebersicht der seit 1847 fortgesetzten Untersuchungen über das von der Atmosphäre unsichtbar getragene reiche organische Leben. Ehrenberg—Nachtrag zur Uebersicht der organischen Atmosphärien. Weber—Ueber ein zum weissen Yajus gehöriges phonetisches Compendium, das *pratijnâsâtra*.

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN.

K. K. Akademie der Wissenschaften zu Wien. Almanac, 1872.

Sitzungsberichte, Mathematisch-Naturwissenschaftliche Classe, Band LXV, Abth. I. II. III, Heft 1-5. January to May, 1872.

Abth. I. Heft 1-2. Tschermak—Die Meteoriten von Shergotty und Gopalpur.

Heft 3-5. v. Reuss—Paläontologische Studien über die älteren Tertiärschichten der Alpen. Brauer—Beiträge zur Kenntniss der *Phyllopoden*.

Abth. II. Heft 1-3. Maly—Ueber das Verhalten der Oxybenzoesäure und Paraoxybenzoesäure in der Bluthahn.

Register zu den Bänden 61 bis 64 der Sitzungsberichte, VII.

Denkschriften, Band XXXII.

Sitzungsberichte, Philosophisch-Historischen Classe. Band LXX, Heft 1-3. January to March, 1872.

Pfizmaier—Zur Geschichte der Erfindung und des Gebrauches der Chinesischen Schriftgattungen. Müller—Zendstudien: III. Beiträge zur Kenntniss der Rom. Sprache: II.

Band LXXI. Heft 1-4. April to July, 1872.

Frankl—Ein mutazillischer Kalâm aus dem 10 Jahrhundert.

Register zu den Bänden 61-70 der Sitzungsberichte, VII.

Denkschriften, Band XXI.

Miklosich—Über die Mundarten und die Wanderungen der Zigeuner Europa's: I.

Archiv für österreichische Geschichte, Band XLVII, (first half). Fontes rerum Austriacarum (Österreichische Geschichts Quellen), Abth. II. Band XXXVI.

THE IMPERIAL ROYAL ACADEMY OF SCIENCES OF VIENNA.

K. K. Geologischen Reichsanstalt zu Wien. General Register der Bände XI-XX des Jahrbuches, und der Jahrgänge 1860-1870 der Verhandlungen.

Jahrbuch, Band XXII, No. 4.

THE I. R. GEOLOGICAL INSTITUTION OF VIENNA.

Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique. Annuaire 1872-73.

Mémoires, Tome XXXIX, 1872.

Mémoires couronnés et autres mémoires publiés par l'Académie Royale.

A. Perrey—Notes sur les tremblements de terre en 1868-69 avec suppléments pour les années antérieures, de 1843 à 1868.

Bulletins. Tomes XXXI-XXXIV, 1871-72.

Observations des Phénomènes périodiques pendant l'année 1870.

Notices extraites de l'Annuaire de l'Observatoire Royal de Bruxelles pour 1873, par le directeur A. Quetelet. Centième Anniversaire de Fondation (1772-1872), 2 vols.

ROYAL BELGIAN ACADEMY OF SCIENCE, LITERATURE AND THE FINE ARTS.

Annales Météorologiques de l'Observatoire Royal de Bruxelles, par Adolphe Quetelet.

Tables de Mortalité et leur développement, par Ad. Quetelet.

THE AUTHOR.

Schriften des Vereines zur Verbreitung naturwissenschaftlicher Kenntnisse in Wien. Band XII, 1871-72.

THE SOCIETY.

Société Impériale des Naturalistes de Moscou. Bulletin, No. 2, 1872.

Baron de Chaudoir—Observations sur quelques genres de Carabiques, avec la description d'espèces nouvelles.

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Société de Physique et d'Histoire Naturelle de Genève, Mémoires, Tome XXI. Parts 1-2.

Part 1. M. Antoine Morin—Matière gélatiniforme; Albuminose, Exalbumine, Galactine.

Part 2. M. D. Colladon—Effets de la foudre sur les arbres et les plantes ligneuses et l'emploi des arbres comme paratonnerres.

THE SOCIETY.

Anales del Museo publico de Buenos Aires. Entrega XI, (quinta del tomo segundo).

Climats, Géologie, Faune, et Géographie Botanique du Brésil, par Emmanuel Liais.

THE IMPERIAL GOVERNMENT OF BRAZIL.

Bataviaasch Genootschap van Kunsten en Wetenschappen. Tijdschrift voor Taal-Land-en Volkenkunde, Deel XVIII, serie 6, Dl. I, Afl. 2. 3. 4.

Deel XIX, serie 6 and 7, Dl. I. Af. 1-6. Deel XX. serie 7, Dl. I, II, Af. 1, 2, 3, Verhandelingen, Deel XXXIII—XXXV.

XXXIII. *J. F. C. Brumund*.—Bijdragen tot de Kennis van het Hindoeïsme.

Notulen van de Algemeene en Bestuurs-Vergaderingen. Deel VIII, Nos. 1 4, 1870. Deel XIX, 1871.

Eerste vervolg catalogus der Bibliotheek en catalogus der Malische, Javaansche en Kawi hand-schriften van het Bataviasch genootschap van Kunsten en Wetenschappen.

Oudheden van Java, op last der Ned.-Indische Regering, gephotographied van J. van Kinsbergen. (A collection of photographs of Hindoo Antiquities in Java.)

THE BATAVIAN SOCIETY OF ARTS AND SCIENCES.

The Christian Spectator, Vol. III, Nos. 25, 26.

THE EDITOR.

Professional papers on Indian Engineering, No. IX, July 1873.

Major *H. Tulloch, R. E.*—On the Kennery, Toolis, Enoor and Vehar Lake Extension projects for the Water Supply of Bombay. Capt. *Allen Cunningham*—On Well Foundations.

THE EDITOR.

Calcutta Journal of Medicine, Vol. VI, Nos. 5 and 6.

THE EDITOR.

Report of the Meteorological Reporter to the Government of Bengal and Meteorological Abstract for 1872.

H. F. BLANFORD, Esq.

A fragment of Indian History, from the Latin of Johannes de Laet. 1631, by E. Lethbridge.

THE AUTHOR.

Variétés Orientales, par Léon de Rosny.

THE AUTHOR.

Anjili ya Luka (Gospel of St. Luke, in Swaheli).

Hadithiza Esopo, (Æsop's fables, in Swaheli).

HOME DEPARTMENT.

Diary of a journey from Gwadar to Karachi through Western Mekran, by Capt. S. B. Miles, Asst. Pol. Agent, Mekran Coast.

Diary of a journey from Bunder Abbas to Bagdad *via* Seistan, Meshed, and Teheran, by Mr. G. Rozario, in Medical charge, Seistan Mission, 1872.

FOREIGN DEPARTMENT.

A Sketch of the History of Orissa from 1803 to 1828, with appendices, by G. Toynbee, Esq., Canal Revenue Superintendent, Cuttack.

General Report of Public Instruction in Bengal for 1871-72.

A Report on the District of Rungpore, by E. G. Glazier, C. S., Offg. Magistrate and Collector, Rungpore.

Report on the Revenue Survey Operations of the Lower Provinces from 1st Oct. 1870 to 30th Sept. 1871.

GOVERNMENT OF BENGAL.

Records of the Geological Survey of India, Vol. VI, Part 3.

Notes on a Celt found by *Mr. Hacket* in the Ossiferous deposits of the Narbada Valley (Pliocene of Falconer); on the age of the deposits by *Mr. H. B. Medlicott*; on the associate shells, by *Mr. W. Theobald*. *W. King*—Notes on the Barikars (Coal measures) in the Boddadanole field, Godáveri District. *W. Hughes*—Coal in India. *W. Theobald*—On the Salt-Springs of Pegu.

THE GEOLOGICAL SURVEY OF INDIA.

Voyage d'Exploration en Indo-Chine, effectuée pendant les années 1866, 1867, 1868, par une Commission Française présidée par M. le Capitaine de Frégate, Doudart de Lagrée, publié sous la direction de M. le Lieut. de vaisseau, Francis Garnier. In two volumes, with two atlases of plates.

*Exchange.*

Athenæum, January and February, 1873.

Nature 188—191.

*Purchase.*

Journal des Savants, December 1872.

*De Quatrefoiges*.—Les races de l'archipel Indien.

Révue et Magasin de Zoologie, 1871-72, Nos. 11 and 12.

*H. Gilmiti*—Catalogue raisonné des Coléoptères, Cicindilides et Carabides, et *Ch. Oberthur*—Catalogue raisonné des Lépidoptères rapportés par M. Th. Doyrolle de son exploration Scientifique en Asie Mineure, descriptions des espèces nouvelles.

The Indian Annals of Medical Science, No. XXXI, July 1873.

*D. D. Cunningham*—Translation of Prof. Max v. Pettenkofer on "Typhoid Fever: its relation to Soil water." *W. J. Moore*—Native practice in Rajputana. *V. Richards*—Experiments with Snake Poison.

The Indian Antiquary, Vol. II, Parts XIX, XX.

XIX, On copying Inscriptions. *J. Beames*—The early Vaishnava poets of Bengal: No. 2—Chandī Dās. *H. J. Stokes*—Walking through Fire. *E. Rehatsek*—Translation of Lassen on Satranjaya and the Jains. *W. F. Sinclair*—Stone and Wooden monuments in Western Khandesh.

XX, Major *J. W. Watson*—Story of Rānī Pinglā. *W. F. Sinclair*—List of Weapons used in the Dekhan and Khandesh. *G. H. Damant*—Inscriptions on a Cannon at Rangpur. *F. J. Leeper*—The Naladiyar. *Rev. M. Phillips*—Tumuli in the Salem District. *W. F. Sinclair*—Notes and Legends connected with Animals II. *J. A. May*—Notes on the Bhondas of Jaypur.

*Books purchased.*

Hindoo Tales, translated from the Sanskrit of the Dasakumaracharitam, by P. W. Jacob.

The Life of H. T. Colebrooke, by Sir E. T. Colebrooke.



Viae et Regna, descriptio ditionis Moslemicae, auctore Abu'l-Kasim Ibu Haukal, (Part II, of M. J. de Goeje's Bibliotheca Geographorum Arabicorum).

Ein Mutazilitischer Kalâm, aus dem 10. Jahrhundert, von. Dr. P. F. Frankl.

Zur Characteristik Galâl-ud-dîn us-Sujûtis und Seiner Literarischen Thätigkeit, von Dr. Ignez Goldziher.

Ceremonia apud Indos, quae vocatur jâtakarma, by J. J. Speijer.

Wörterbuch zum Rig-Veda, von Hermann Grassmann, Part II.

Die Verwandschaftsverhältnisse der Indogermanischen Sprachen, von Johannes Schmidt.

Grammaire de la Langue Mandehou, par Lucien Adam.

Rhetorique et Prosode des Langues de l'Orient Musulman, par M. Garcin de Tassy.

Abhandlung zur zerstreung der vorurtheile über das alte und neue Morgenland, von H. Ewald.

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR NOVEMBER, 1873.

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The Monthly General Meeting of the Society was held on Wednesday, the 5th instant, at 9 o'clock P. M.

Col. Hyde, R. E., President, in the chair.

The minutes of the last meeting were read and confirmed.

The following presentations were laid on the table—

1. From the Royal University of Norway, small collections of Minerals and Coleopterous insects, also a Medal issued by the University in commemoration of the Millenary Jubilee celebrated 18th July, 1872, in the Kingdom of Norway, which Kingdom was constituted by the king Harald Haarfager in the year A. D. 872.

The President remarked that no list or description of the minerals had been received, but they would be sent to the Superintendent of the Geological Survey for classification and afterwards deposited in the Museum.

2. From Bábu Yadavachandra Mukerji, a large palm-leaf MS. of the Rámáyana, Ayodhyakanda found floating in the river Húgli, at Kamarhati.

3. From Sirdar Attar Sing Bahádur, a copy of Sakhee Book or description of Gooroo Gobind Singh's Religion and Doctrines.

From Eroud Tamoorus Deenshah Unelshariah, Editor of "Shavuk Nameh," through Mr. B. Cowasjee, a copy of his Gujrati Poetry.

4. From Col. Guthrie, a cast of a Bengal coin of Firúz Sháh the Second.

Mr. Blochmann said :—

This cast is taken from an apparently unique silver coin in the British Museum. The coin was struck by Saifuddin Abul Muzaffar Firúz Sháh (II.) of Bengal, in 893 A. H. I have collected what little there is known of this king in my "Contributions to the History and Geography of Bengal."

5. From H. Beveridge, Esq., C. S., a copper-plate inscription found at Bakirganj.

The following letter accompanied the donation—

"The copper plate was found in May last by one Ram Kumar Bhismali while he was digging a tank at the village of Brahmandi in the north of this district and not far from the Madaripur bazaar. It was found at a depth of eight or ten cubits under the earth. It is supposed that the plate belonged to the Roy family, who first settled in Brahmandi. The place where it was found is near the house of Sám Sundra Rai, who is the only surviving descendant of the family. No one here can decipher the inscription. I am indebted for the possession of the plate and for the above particulars to one of my Deputy Collectors, Babu Hari Mohan Sein.

The following gentlemen are candidates for ballot at the next meeting.

J. Sykes Gamble, Esq., Assistant Conservator of Forests, Silligorce, proposed by S. Kurz, Esq., seconded by Dr. W. Schlich.

His Highness the Maharaja of Johore, K. C. S. I., K. C. C. I., proposed by Mr. J. Wood-Mason, seconded by the President.

M. L. Dames, Esq., C. S., Assistant Commissioner, Karnál, Panjáb, proposed by J. Delmerick, Esq., seconded by D. C. Ibbetson, Esq., C. S.

Bartle O'Brien, Esq., M. D., proposed by Mr. J. Wood-Mason, seconded by Dr. V. Richards.

J. Elliott, Esq., M. A., Professor of Mathematics in the Muir Central College, Allahabad, proposed by Mr. A. S. Harrison, seconded by Captain J. Waterhouse.

J. Blackburn, Esq., proposed by D. Waldie, Esq., seconded by Captain J. Waterhouse.

Kenneth McLeod, Esq., M. D., Secretary to the Surgeon General, Indian Medical Service, proposed by H. F. Blanford, Esq., seconded by C. Tawney, Esq.

The following gentlemen have intimated their desire to withdraw from the Society :—

The Hon'ble Sir R. Couch, Kt.

H. Woodrow, Esq.

Col. G. H. Saxton.

Col. B. Ford.

Sultán Muhammad Bashiruddin.

Mr. Wood-Mason exhibited a specimen of *Carcinus manas*, Pennant, taken in 1866 or 67 at Point de Galle Ceylon by Dr. J. Anderson. Comparison of this specimen with those from the Mediterranean lately received from Prof. Cornalia of Milan had enabled him to be sure of the correctness of his previous identification from the published figures and descriptions. The species appeared to have an exceedingly wide distribution, being to be found

in abundance on the shores of the British Isles, and of the United States whence it extended to the Arctic Sea, and on all the Mediterranean coasts: it had also been recorded by Heller from Rio Janeiro, and specimens would doubtless ultimately be met with in the Red Sea.

The President announced that the Council had appointed Mr. A. Pedler a member of the Physical Science and Library Committees.

The following papers were read—

1. *Notes on Aquila naevioides, A. fulvescens and A. vindhiana.*

By W. E. Brooks, C. E.

Having received from my friend, the Rev. Dr. Tristram, an African example of the true *Aquila naevioides*, Cuv., I am in a position to state that the Indian bird hitherto known under that name is quite a different species, viz.—*Aquila fulvescens*, Gray, as is clearly shewn in Gray and Hardwicke's "Illustrations of Indian Zoology."

Our Indian species can easily be distinguished from the African bird: 1, by its *small round nostril*, and 2, by its *plain black unbarred tail*. The nostril of the African bird is *long and vertical*, like those of *A. vindhiana*, *A. mogilnik*, and *A. bifasciata*. Its tail also, is a well-barred one, in character like that of *A. vindhiana*.

Some years ago, I sent two of the rare *A. fulvescens* to England for identification; the one a buff or tawny immature bird, and the other a dark rufous brown adult. By the English ornithologists they were pronounced to be identical with the African *A. naevioides*; and as such were accordingly entered in our Indian lists. Dr. Jerdon also accepted the identification.

I am glad to have been able at last to find out the mistake, and so to re-establish the fine species so long suppressed on account of its supposed identity with another species. It will be remembered that another species of the same author, *A. bifasciata*, has also been restored to its rightful place, after having been for years confounded with *A. mogilnik* (*A. imperialis*).

The term *A. fulvescens* has been erroneously applied, as Mr. Gurney first pointed out to me, to our common Wokhab, whose correct name is *A. vindhiana*, Franklin: a glance at the plate of *A. fulvescens* in Gray and Hardwicke's work sufficing to shew not this only, but also that the species intended is the rare one hitherto confounded with *A. naevioides*. *A. fulvescens*, by its roundest of round nostrils and plain black tail, is at once distinguished from the other two in any stage of plumage: it has tawny immature plumage and a dark red-brown adult one.

*A. naevioides* has also a tawny plumage and a darker brown one. Its

fine rich warm colours will at any time separate it from the dull-coloured Indian Wokhab, *A. vindhiana*.

*A. vindhiana* has a light and a dark plumage; but the light one is merely a pale whity-brown; and this pale plumage instead of being characteristic of immaturity is on the contrary the plumage of the adult bird, as far at least as my observations go. I have repeatedly shot these old whity-brown birds from the nest. Some examples fade more than others, and I believe this pale plumage to be more the result of the colour not being *fast* than the mark of any particular age. I have in one and the same species, *viz.*, in *Aquila navioides*, examples almost black, and others pale sandy brown; so widely different, in fact, are examples of the two extremes of coloration that any one not acquainted with the characters of the species would be much perplexed.

I should observe that *A. fulvescens* is only a cold weather visitant to the plains of India, while *A. vindhiana* and *A. navioides* are non-migratory species.

I append a description of the specimen of *A. navioides*, as it may prove useful.

*Aquila navioides*, Cuvier.

Whole body plumage, from head to tarsus, a rich light reddish brown or tawny; on the breast and sides are some feathers with part of one web patched with purple brown; wing coverts, both lesser and greater, a mixture of very pale and dark brown, varied with tawny, the pale colour predominating and occupying the margins of the feathers, scapulars and inter-scapulars, rich purple brown, with tawny terminal stripes to each feather; giving the bird a very striped appearance about the shoulders and mantle; primaries blackish, but paler and barred on their inner webs towards the bases; secondaries lighter and pale-tipped, being very conspicuously barred on both webs; tertials still paler, and well-barred on both webs; lining of wing light reddish brown; axillaries the same; lining-feathers under tertials nearly pure white; tail hoary brown, barred in the same manner as that of *A. vindhiana*. There is no conspicuous pale tip. The eyebrow is very distinct and black, much blacker and better marked than in either of the other eagles referred to in this paper. The tibial and tarsal plumes are long and fine, and of as bright a red or tawny, as any other part of the body; the lower tail coverts are also of the same bright tawny red. One peculiar characteristic of this eagle is the strong purple gloss on the brown of the scapulars and upper wing coverts. The nostril is a long vertical one as in *A. mogilnik* and *A. vindhiana*, and also similar to that of *A. bifasciata*.

This is one, and the well known stage of this eagle's plumage, but it

has also another of a darker brown, as shewn in the illustration of the 'Ibis' for April 1865.

Length about 26 inches; wing 19·75; tail 10·5; bill at front 2 in.; from gape 2·4; height at base 1·12; tarsus 3·25; mid toe and claw 3 in.; hind do. 2·25; bill dark horny, bluish grey at base; cere apparently bright yellow; feet the same; claws black.

Hab.—Great Namaqua Land.

2. *Notes on the Certhiinae of India.*—By W. E. Brooks, C. E.

The author recognizes five species two of which are described as new. The paper will appear in the forthcoming number of the Journal.

3. *On the Muddy Water of the Hugli during the rainy season with reference to its purification and to the Calcutta Water-supply.*—By D. WALDIE, Esq., F. C. S.

Abstract.

The author commenced by referring to a long series of experiments made by him in 1868 and 1869 on the best kind of sand to be used in the filters at Palta for the supply of water to Calcutta, and on the merits of a particular contrivance called Spencer's Regulating Cup proposed to be used in these filters and alleged to be of great value in filtration. His enquiries resulted in the condemnation of that cup as possessing no *special* advantage over other plans for producing the same effect that it had, and in his recommending the employment of a finer sand than that used generally in England, for the filtration of the Hugli water during the rainy season, during which period it is attended with peculiar difficulty. It had been found of late, as the demand for water increased, that the difficulty in supplying it had become very serious. This difficulty had been treated as a failure of the plan adopted, which had been condemned on account of its departure from the principles of filtration recognised in England; and it was proposed to remedy this by reverting to practice founded on these principles and more especially to the use of the Regulating cup.

The author on the other hand maintained the correctness of his results and conclusions, and contended that the proposals just mentioned were founded upon principles fundamentally erroneous, because the real source of difficulty lay in the peculiar quality of the river water during the rains, which caused it to penetrate deep into the sand in a way which English waters similarly treated did not do. He connected this peculiarity with the large rainfall, limited to four or five months of the year, though he could not with certainty explain the reason why it did so. Nevertheless he firmly adhered to it as a fact.

About the 1st of August last, an idea suggested itself to him of a cause by which possibly the peculiarity might be accounted for, and a reference

to experiment shewed that it was correct. The difficulty in the settling of the mud arises from the great state of dilution of the water. Some facts had been long observed by chemists bearing more or less directly on the subject, and special observations had been made, particularly by Skey and Schloesing, on the separation or precipitation of mud from water; a consideration of all these things suggested that if the deficiency of saline matter in the water of the rains was made up by the addition of such matters to it, so as to bring the water up to the standard of that of December or January, the mud would then settle much more readily and possibly be so much altered as to enable the water to be filtered easily. This was found by experiment actually to be the case. The saline matters in the water act as precipitants of the mud if in sufficient quantity: during the rains they are not in sufficient quantity, if doubled they are. Assuming 7 grains of Carbonate of Lime (in solution) as equivalent to the salts of Lime and Magnesia in 100,000 grains of the Hugli water at its extreme degree of dilution, the addition of an equal quantity of Carbonate of Lime (in solution) or of Carbonate of Magnesia (in solution) or of Sulphate of Lime precipitates the mud well. Double the equivalent of Chloride of Calcium is requisite as it has only half the efficacy. The alkaline salts have comparatively little influence. The salts of lime and magnesia, particularly the carbonates, held in solution by carbonic acid, are the chief active ingredients in producing the effect. They cause the very fine particles of clay to coalesce and aggregate into larger and denser ones which in the course of 24 to 48 hours settle well, and the water can then be filtered easily. The clay has been said to be coagulated and the term seems appropriate.

Corroborative evidence has been found in the peculiarities of some river waters on the European continent, particularly those of Alpine origin, which are liable to occasional unusual dilution and accompanying muddiness, such as the Garonne, from which Marseilles is supplied. A peculiar system of filtration is employed there, appropriate to the purpose. The river waters in England are liable to no such *extreme* changes, consequently their muddy water has no such peculiarities or only to a comparatively small degree.

It was found on extending the enquiry that acids, alkalies and alkaline earths, and many other saline substances possessed the same property, and many of these to a much greater degree. Thus salts of Manganese and Copper and protosalts of Iron are effective in considerably smaller quantities than salts of Lime and Magnesia, and salts of the sesquioxides, namely, Alumina and peroxide of Iron are the most effective of all. Tables are given in the paper shewing approximately the quantities of these substances necessary or sufficient to produce the same effect. The differences in power between common salt and Lime salts, and between Lime salts and Ferric salts are very great.

Thus for instance taking Carbonate of Lime dissolved by excess of Carbonic acid as the standard, Sulphate of Lime is about equally effective, common salt and alkaline salts generally have only about one-twentieth part of the power, Protosulphate of Iron has about six times the power and Persulphate or Perchloride of Iron about forty times the power, so that a very small quantity of persalts of Iron is sufficient. It is to be understood that with the minimum quantities employed a period of from 24 to 48 hours was always given to produce the effect. The quantities necessary are only given as approximations, and there is more doubt connected with those for the salts of the heavy metals and sesquioxides than with those of the earths and alkalis, because, on account of the early cessation of the rains, the river water began to lose its peculiar difficulty in clearing while these salts were being experimented on. The comparison is therefore not so much to be depended on, but the differences in relative power are much greater than had been previously noticed by other observers; this, at least, in their application to this particular water.

The author had quite recently met with Schloesing's original paper which previously he had seen only very briefly and imperfectly abstracted, and found that Schloesing's results were very similar to his own, and that he also suggested similar means for treating highly diluted muddy water difficult to settle, namely, that of restoring it to its natural condition by the addition of Lime salts or other of its normal constituents. But he did not push the enquiry further. The extension to other salts and the discovery of the very small proportion of salts of Alumina and Peroxide of Iron, particularly of the latter, that are sufficient when an interval of 24 to 48 hours is given for settling, to purify the water, so that it can be filtered easily, greatly favours the probability of the application of the principle in practice.

Details are given in the paper.

Mr. Blanford said he had listened with much interest to Mr. Waldie's account of his investigations into the action of salts in solution, in facilitating the precipitation of matter mechanically suspended in the water. Mr. Pedler had found that, by adding to the water a quantity of lime equal to that in solution, and precipitating the whole as insoluble calcium carbonate, (a well known method of softening hard water) the suspended matter, however fine, was carried down with the precipitate but the process described by Mr. Waldie appeared to rest on some different principle, which yet remained to be elucidated. With respect to the regulating cups, which he understood had not been tried by Mr. Waldie, he thought it would have been more satisfactory if he had experimented upon them before utterly condemning them. Looking at the question from an *a priori* point of view, it certainly seemed that an upward filtration is likely to be more effectual in removing fine matter in suspension than the downward method; and he knew that Mr. Clark had much confidence in these cups.



Dr. Waldie then exhibited one of the Spencer's cups and explained that the water was completely filtered before it reached the cups and so there could not possibly be any upward filtration; all that the cups could do was to prevent more than a certain quantity of water passing in a given time, which could be done equally well or better by other arrangements. The cup had been actually tried during the whole rainy season of 1869 and the conclusions come to had been derived from these experiments.

Mr. H. B. Fenwick C. E., in charge of the Water Works at Palta, gave a brief description of some experiments made with the Spencer's cups which proved conclusively that they would not answer the purpose intended.

Mr. Fenwick said, that at Mr. Clark's suggestion he had tried the cups; a filter 12'  $\times$  12' was constructed at Palta fitted with four of Spencer's regulating cups and was supplied from the same source as the large filters. The discharge was found to be in proportion to that of the large filters as 3 to 1; the materials were then removed and four of the holes in each regulating cup stopped up, the discharge then amounted to  $2\frac{1}{2}$  to 1; two more were then stopped up, thereby reducing the original ten holes to four in each cup, and the discharge was then 2 to 1 in proportion to that from the large filters. During the rainy season the water which flowed from this filter was very much inferior in transparency to that from the large filters during the same period, in fact it was very inferior to that from the large filters at their worst.

#### 4. *On the Climate of Bengal.*—By H. F. BLANFORD ESQ.

Although Bengal is situated for the most part without the tropical zone, its climate is characteristically tropical. The mean temperature of the whole year varies between  $80^{\circ}$  in Orissa and  $74^{\circ}$  in Asám; that of Calcutta being  $79^{\circ}$ .

In the annual range of the temperature, as well as in point of humidity and rainfall, the eastern and western portions of the province are strongly contrasted. In Kachár, nearly 200 miles from the sea, the mean temperature of June is  $82^{\circ}$ , that of January  $64.5^{\circ}$ , and the highest and lowest temperatures recorded during 5 years, *viz.*,  $99^{\circ}$  and  $43^{\circ}$  shew an absolute range of  $56^{\circ}$  only. At Chátgáon, on the sea coast, the recorded range does not exceed  $40^{\circ}$ . On the other hand, Patna has a mean temperature of  $87.2^{\circ}$  in June and  $60.7^{\circ}$  in January; and in 1869, the highest and lowest temperatures registered were  $116.3^{\circ}$  on the 12th May, and  $36.9^{\circ}$  on the 3rd and 4th of January; the absolute range of this single year was therefore  $79.4^{\circ}$ . It is probable that some parts of Bihár, the neighbourhood of Gya for instance, experience a range somewhat greater than that of Patna.

The highest temperature recorded in Calcutta during the last 18 years is  $106^{\circ}$ , which has been reached twice only; *viz.*, in May 1867 and again in May of the present year. The lowest temperature  $52.7^{\circ}$  has been record-

ed also twice, *viz.*, in January 1860 and 1864, and  $52.8^{\circ}$  has been observed twice, *viz.*, in January 1857 and 1861. The extreme absolute range of the temperature of the Capital is therefore a little over  $53^{\circ}$ , and the mean temperatures of December and May are  $68.5^{\circ}$  and  $85^{\circ}$  respectively. The annual rise and fall of temperature exhibits some other local variations. Thus in Orissa and the Western part of the Gangetic Delta, December is the coldest month of the year; elsewhere the temperature reaches its minimum in January. This difference is due to the sea-winds setting in on this part of the coast very early in the year; whereas on the Arakan coast and in Bihár, their influence is not felt till much later in the season.

May is the hottest month of the year in all parts of the Lower Provinces with the exception of a part of Bihár, Asám and Kachár. In the former, the average temperature of June is a little above that of May; and in the latter districts, which enjoy a comparatively cool but humid atmosphere in April and May, the temperature rises slowly and uniformly up to July or August. In upper Asím it is higher than in the lower part of that province, from May to October; and higher also than in Kachár. The mean temperature of Sibságar in July and August is  $84.7^{\circ}$ , that of Goalparah  $81.2^{\circ}$ , and that of Silchár  $82^{\circ}$ .

During the rains, the temperature of the Hazáribágh plateau, to the West of the Delta, falls more rapidly than that of any other part of Bengal. Between May and October, the fall at Hazáribágh is rather more than  $11^{\circ}$ ; while at Barhampúr, under about the same latitude, it is only  $4\frac{1}{2}^{\circ}$ ; at Calcutta little more than  $3^{\circ}$ , and even at Patna it does not exceed  $8^{\circ}$ . This peculiarity appears to be due principally to the cloudiness of the plateau in the daytime, whereby the sun's heat is rendered less intense; and to the greater radiation at night. This fact has an important bearing on the value of Hazáribágh as a station for European troops, and as a sanitarium for invalids from the plains.

The high humidity of the atmosphere in Bengal, and more especially in its Eastern districts, has become proverbial; and if the term be used in reference to the quantity of vapour in the air, as measured by its tension, the popular belief is justified by observation. But if used in the more usual sense of Relative Humidity, that is, as referring to the percentage of vapour in the air, in proportion to that which would saturate it, the average annual humidity of a large part of Bengal is considerably lower than that of England. In illustration of this, I give a comparative table of the mean vapour tension and relative humidity of London and Calcutta in each month of the year, and the mean of the whole year; the data for the former place being taken from an Essay on the Climate of London by the late Professor Daniell; those for the latter from the results of the hourly observations registered at the Surveyor General's Office, Calcutta, and computed in the Meteorological Office

of Bengal. The former are deduced from 17 years, the latter from 14 years observations.

*Mean vapour tension in thousandths of an inch.*

|               | Jan. | Feb. | Mar. | Ap.  | May  | June | July | Aug. | Sep. | Oct. | Nov. | Dec. | YEAR.      |
|---------------|------|------|------|------|------|------|------|------|------|------|------|------|------------|
| London, ...   | ·215 | ·264 | ·280 | 315  | ·340 | ·490 | ·531 | ·530 | ·468 | ·389 | ·310 | ·281 | ·376 inch. |
| Calcutta, ... | ·487 | ·549 | ·695 | ·805 | ·889 | ·947 | ·951 | ·950 | ·950 | ·828 | ·605 | ·489 | ·762 „     |

*Mean Relative Humidity.*

SATURATION 100.

|               | Jan. | Feb. | Mar. | Ap. | May | June | July | Aug. | Sep. | Oct. | Nov. | Dec. | YEAR. |
|---------------|------|------|------|-----|-----|------|------|------|------|------|------|------|-------|
| London, ...   | 97   | 94   | 89   | 84  | 82  | 82   | 84   | 85   | 91   | 94   | 96   | 97   | 89    |
| Calcutta, ... | 71   | 68   | 67   | 69  | 73  | 81   | 85   | 86   | 85   | 78   | 73   | 72   | 76    |

The quantity of vapour in the air of Calcutta, relatively to the dry air, is then, on the average of the year, about twice as great as in that of London;\* but the relative humidity of the former equals that of the latter only in the three first months of the rains, which are among the driest months of an European climate.

The absolute humidity of the atmosphere is greatest on the coast of Orissa and the Sunderban, and diminishes inland as the distance from the sea increases. In the cold weather and spring months, this decrease is rapid everywhere, except in Eastern Bengal. In Kachár, however, the quantity of moisture in the air is as great as on the coast of Chátgáon, and even exceeds it, excepting between the months of February and May. During the hot weather months, the proportion of vapour to dry air increases steadily and rapidly in all that part of Bengal in which the hot westerly winds are not a regular phenomenon of the season; that is to say, on the Gangetic delta, in Eastern Bengal, and on the maritime plain of Orissa; but on the high ground further west and in Bihár, as well as generally in the N. W. Provinces, its increase is slower up to May or June, and it then rises rapidly

\* In Calcutta the vapour of water constitutes on an average about two and a half per cent. by volume of the atmosphere; in London only one and a quarter. Next to the temperature, this is perhaps the most important climatal difference of the two places in all that affects health.

almost to an equality with that of the maritime region. This is clearly traceable to the winds ; since, in the former region, winds from the sea predominate throughout the hot season, mitigating its temperature indeed, but at the same time rendering the atmosphere damper ; and producing, when the air is calm, that oppressive feeling of sultriness, which is so trying to persons accustomed to the drier atmosphere of Bihár and the North-West.

The relative humidity of air or its nearness to saturation depends on the temperature as well as on the absolute quantity of vapour it contains. If the latter be constant, the air, as is well known, is drier with a high temperature than a low one. Thus arises, in the cold weather months, the apparent anomaly that, although the *absolute* humidity of Upper India at that season is considerably less than that of Bengal, its *relative* humidity does not undergo a corresponding diminution, owing to its lower temperature. At Banáras for instance and even at Láhor, as appears from the Panjáb reports, the relative humidity of the air in January and February exceeds that of Dháká and Barhampúr. In this sense the driest period of the year falls later and later in the spring months as we proceed inland. At Sagar Island, January is the driest month ; at Calcutta, February and March ; at Patna, April ; at Banáras, April and May ; while at Láhor and all places in the Panjáb, May and June are the months of greatest siccity. The frequency of rain depends on relative rather than absolute humidity ; the quantity of rain that falls, other things being equal, chiefly on the absolute humidity of the air.

Eastern Bengal, including Kachár and Silhet, and the Himálayan Tarai, are the districts of the heaviest rainfall. Their average annual fall almost every where amounts to 100 inches ; and on the exposed hill flanks, and at their foot, even this large amount is greatly surpassed. Thus Silhet has an annual average of 141 inches. Darjiling 126 inches, the Rangbi Cinchona plantation 175 inches, Buxa Fort 280 inches, (the average of three years,) and Cherra Púnji the enormous amount of 527 inches ; this last is the highest average rainfall hitherto recorded in the world. The rainfall is also higher on the plains of the coast than on those lying more inland. Thus Sagar Point has an average of 87 inches and Calcutta 66, False Point 74 inches and Katak 52.5. The lowest rainfall in the provinces under the Bengal Government is that of the Southern portion of Bihár, including Monghyr, Gya and Patna, where the annual fall does not much exceed 40 inches ; and in the case of the last mentioned station is only 37 inches. North of the Ganges, it increases gradually up to the Himálaya ; and, on the south, up to the high ridge of forest-clad country which is drained by the Son, the Damúdar and their tributaries. In this tract, where the monsoon winds from the opposite coasts of India meet, the fall of the few stations that have hitherto furnished registers, ranges between 50 and 60 inches. In

Calcutta the highest rainfall on record is that of 1871, when it amounted to 93·31 inches; the lowest during the last forty-five years is that in 1837, when the registered fall was as low as 43·61 inches. In subsequent years the lowest falls were those of 1838 (53·? inches), 1853 (52·08 inches) and 1860 (52·61 inches); up to the present year 1873, which now, (in November,) exceeds that of 1837 by about one inch only. The Cherra Púnji register of 1861 records a fall of 805· inches, of which 366· inches fell in the month of July alone; but it is not clear that this register is deserving of complete reliance. Twelve inches of rain in one day is however, far from unusual at Cherra Púnji. On the 13th June, 1861, an equal quantity fell in Calcutta within 24 hours, and on the 11th May 1835 the same quantity fell within three hours.

By far the greater part of the rainfall of Bengal falls between the months of June and October. Showers occur also in the hot weather months, and in the months of February and March hail-storms are not infrequent. In the Eastern districts, rain occurs occasionally in the cold weather months, but is less common in the Delta and the country further Westward, excepting in the N. W. Provinces and the Panjáb. In the Eastern districts and in Asám, rain is more abundant in all the earlier months of the year, and in April it sets in heavily, and reaches its maximum about June or July. Further to the West, the rains usually set in in June, and July and August are the months of the heaviest fall.

Except at the hill stations and in the immediate neighbourhood of the hills, the average proportion of cloud-covered sky varies between one-third and one-half of the whole. At Darjiling, on an average, the proportion of clouded sky to sunny sky is as 2 to 1. In Lower Bengal generally it is about 1 to 2; being however, rather higher on the coast. December and January are on the whole the brightest months of the year; but November, February and March are almost equally serene. June, July and August are the months of greatest obscurity. In these former months, the proportion of cloud is on an average from 10 to 15 per cent., in the latter months from 65 to 85 per cent.

These observations refer to visible dense cloud, but the depth of the sky tint indicating the pressure or absence of diffused cloud in the upper regions of the atmosphere would appear to follow a different law. No systematic observation has been made on the colour of the sky, but as the results of my own casual observations I gather that the sky tint is, on an average, much paler in the cold weather, than during fine intervals of the rains, indicating a greater quantity of condensed moisture at great altitudes.

The wind system of Bengal is so often referred to as a familiar illustration of the monsoons, that it might seem almost superfluous to re-describe a subject treated of in every text book on Meteorology. But it appears

from recent investigations, that, however well known at sea, the character and origin of the monsoons on the land have been very generally misunderstood. The monsoons are not two undivided currents, flowing to and from Central Asia during about equal periods of the year; but appear rather to consist, at each period, of at least two principal currents, the one tending to or from Northern India, the other to or from the interior of China; and there are probably other minor currents originating or terminating at other centres. The Indian branch of the winter monsoon originates in the plains of the Panjáb, the Gangetic valley, and the uplands of Central India; also in upper Assam; and blows as a very gentle wind towards the two great bays that wash the East and West coasts of the Peninsula. During this season, a Southerly wind prevails steadily on the Himalaya at heights above 6000 or 8000 feet, descending lower on the Western than on the Central part of the range. This appears to be the upper return current of the winter monsoon, and corresponds to the anti-trade of the trade wind region. It descends on the plains of Upper India, where the atmosphere is characteristically calm at this season; and brings the winter rains. It is less frequently felt in Lower Bengal, where the wind is variable from North and North-West; but to the eastward in Kachár, southerly winds are very prevalent at the winter season. In Northern India the two branches of the northerly monsoon appear to diverge towards the opposite coasts, from a line characterized by a ridge of higher mean barometric pressure, which passes from the Panjáb through Banáras to Katak. This monsoon ceases on the coast line of Bengal in the month of February, when in the lower atmosphere, sea winds set in. At first these are restricted to the immediate neighbourhood of the coast; but as the season advances and the heat of the interior plains rises under the influence of the returning sun, they penetrate further and further inland, and are drawn from greater distances at sea. In the interior of India, the wind becomes more Westerly, and blows towards Lower Bengal and Chutiá Nágpúr, not as a steady current, but as day winds, which in April and May are highly heated by the parched and heated soil, and constitute the well known hot winds of those months. Where these two currents meet, the thunder-storms well known as North-Westers are generated. Like the thunder-storms of Europe and the dust-storms of the Panjáb, they are due to convection currents; and in Bengal owe their prevailing movement from the West or North-West quarter to the strength of the land wind, which maintains its course in the upper atmosphere above the opposite sea-wind which is felt at the land surface. At this time the N. W. wind continues to blow unsteadily in the South of the Bay; but calms are not infrequent; and it is not till June that the Southerly winds of the bay become continuous with the South East Trades of the South Indian Ocean, and that the South West monsoon, pro-

perly so called, sets in in India. This blows from both coasts, and the two branches meet along a line which about coincides with the Southern margin of the Gangetic plain. Both tend towards the Panjáb, the region of the greatest heat at this season; and becoming gradually drained of their vapour in their passage over the land, that which remains on their reaching the plains of that province, suffices only to afford a scanty rainfall, inadequate to mitigate the temperature, and only rendering the heat more oppressive by increasing the relative humidity and diminishing the evaporative power of the air.

As an element of climate, apart from its secondary effects on the winds and consequently on the humidity, rainfall, &c., the pressure of the atmosphere is, as far as is known at present, of subordinate importance. In Bengal, as in most tropical countries, its variation, except during the passage of cyclones, is small; scarcely amounting to an inch on the extremes of the year. The average pressure of the air in Calcutta, 18 feet above sea level, is equal to that of a column of mercury at the freezing point, 29·793 inches in height or to 14·6 lbs. on the square inch. It is highest in December, when the mean pressure, similarly estimated, amounts to 30·041 ins.; and lowest in June and July when it falls to 29·551 ins. on the average of the month. The daily variation is greatest in April, when the barometer falls on an average ·141 inch between 9 A. M. and 5 P. M.; and least in July, when the corresponding change does not exceed ·090 inch, and the day and night barometric tides are nearly equal. The irregular variations being small as compared with those experienced in extra-tropical countries, and the regular variations so much more strongly marked, it follows that, as a weather-glass, the barometer is apt to mislead persons who are unacquainted with the laws of its local changes; since the rough generalizations, which serve to interpret its action in Europe, no longer hold good even approximately in India. In certain cases indeed, its action would seem to be anomalous. Thus it generally rises rapidly before one of those thunder-storms that are so common in the hot weather; and at Cherra Púnji, the extraordinary rainfall of which would lead most persons to anticipate a generally low pressure during the rainy season, after allowing for differences of elevation, the pressure is, on an average, considerably higher than in Western Bengal, the N. W. Provinces and the Panjáb at this time of the year. Moreover, it appears from information supplied by Major H. H. Godwin-Austen that at this place the barometer rises before heavy rain, and remains high as long as the rain continues. When interpreted with proper precautions, the barometer is, nevertheless, as trustworthy and valuable a monitor of impending weather in India as it is elsewhere.

The storms prevalent in Bengal are of two classes. First those of the hot weather already noticed, which are formed over the land, and are of the nature of convection currents, like the summer storms of Europe; and second,

those more extensive and destructive storms, that originate over the Bay of Bengal, and are most frequent at the changes of the monsoons. These latter have received the distinctive name of Cyclones; and the name is perhaps as good as any other, since in them a vorticose motion of the wind is a strongly marked character, and one of great practical importance; but it is by no means a character peculiar to these storms, since it may frequently be observed in a slight degree in the ordinary North-Westers, and Tornados which are apparently merely a severe form of the North-Wester, and differ from a typical cyclone only in their originating over the land, in their inferior size and shorter duration. It may be indeed that the direction of their circulation is not so constant as in the greater storms, but existing evidence is insufficient to settle this point. The dust-storms of the Upper Provinces also, have been shewn by Dr. Baddeley to consist of one principal and numerous minor vortices, exactly like the larger storms of oceanic origin. The pressure of the wind in Tornados and even in ordinary North-Westers is sometimes comparable with that of cyclones, and, within a limited area, the former are not less destructive. There is an important difference in the character of the surface wind in these two forms of land storms. In the North-Wester the violent wind usually precedes the storm, blowing outwards, and being in fact a descending current brought down by the friction of the falling rain. The centripetal currents which feed the storm are not felt at the ground surface, though they may frequently be traced in the motions of the lower clouds. In the Tornado, on the other hand, as in the true cyclone, the violent surface winds are centripetal and vorticose.

The Cyclones felt in Bengal begin, in all cases, over the Bay; and the more violent and extensive storms, which alone reach the land, probably require many days to form before they move forward from their place of origin. Some of the most destructive that have passed over Bengal, have proceeded from the neighbourhood of the Andaman and Nicobar Islands. Their relative frequency in the different months of the year is shewn in the following table, which includes storms of all parts of the Bay, and those that have been felt on all parts of its coasts, Bengal included.

|                |   |               |    |                  |    |
|----------------|---|---------------|----|------------------|----|
| January, ..... | 2 | May, .....    | 17 | September, ..... | 3  |
| February, ...  | 0 | June, .....   | 4  | October, .....   | 20 |
| March, .....   | 1 | July, .....   | 2  | November, .....  | 14 |
| April, .....   | 5 | August, ..... | 2  | December, .....  | 3  |

Of these seventy-three storms, twenty-three have been felt in Bengal or on its coasts, and all between the months of April and November inclusive. Their course is usually North across the Gangetic Delta, North West from the Orissa coast. The motion of the wind is in an involute spiral, revolving in a direction opposite to that of the hands of a clock, as in all cyclonic storms in the Northern Hemisphere. The greatest pressure of the



wind in these storms has yet to be ascertained. The highest that has been registered in Calcutta, by an Osler's Anemometer, is 50 lbs. to the square foot; but this was in a storm of no remarkable violence, and one which did but little injury in Calcutta. The centre of the storm, at the time, was passing some 15 miles to the East of the city, and the barometer stood at 28.712. In the far more severe storms of the 2nd November, 1867 and the 5th October, 1864, the Anemometer was blown away, under a pressure of 36 lbs. to the square foot, so that no register of their maximum force was obtained. There is a prevalent impression that cyclonic storms have been more frequent of late years than formerly, but the belief does not appear to rest on any sound basis of fact. Since the destructive storm of October, 1864, the attention of the public has been attracted to the subject more steadily than in former years; and many a storm that would have escaped notice, or, if reported in a newspaper paragraph, would have been speedily forgotten, is now made the subject of general conversation for the time, and recorded with all procurable detail, in the annual Meteorological Reports. To this cause probably may be attributed the popular belief in the greater frequency of storms in recent years. 1869 and 1872 were both stormy years.

The reading of the following papers was postponed—

1. On a secondary sexual character in *Squilla raphidea*, Fabr. By J. Wood-Mason, Esq.
2. Enumeration of Burmese Palms. By S. Kurz, Esq.,
3. Note on two Muhammadau Gold Coins. By the Hon'ble E. C. Bayley, C. S. I.
4. On the Ruins of Dimápúr, in the Nágá Hills. By Major H. H. Godwin-Austen.

#### LIBRARY.

The following additions have been made to the Library since the meeting held in August last.

#### *Presentations.*

##### •• Names of Donors in Capitals.

Royal Society, Proceedings, Nos. 144-145.

No. 144. *J. Norman Lockyer*—Researches in Spectrum-Analysis in connexion with the Spectrum of the Sun. No. II. *Major W. A. Ross*—On Jeypoorite, a Sulph-antimonial Arsenide of Cobalt. *C. Melldrum*—On a periodicity of Rainfall in connexion with the Sun-spot Periodicity.

No. 145. *H. G. Bastian*—Further observations on the temperature at which *Bacteria*, *Vibriones*, and their supposed Germs are killed when exposed to heat in a moist state; and on the causes of Putrefaction and Fermentation. *C. C. Pode* and *E. R. Lankester*,—Experiments on the Development of *Bacteria* in Organic Infusions.

*T. Lauder Brunton* and *J. Fayerer*—On the Nature and Physiological Action of the Poison of *Naja Tripudans* and other Indian Venomous Snakes. *F. Chambers*,—The

Diurnal Variations of the Wind and Barometric Pressure at Bombay. *W. K. Parker*.—On the structure and development of the Skull in the Pig (*Sus scrofa*). *Lieut.-Col. A. R. Clarke*.—Results of the comparisons of the Standards of Length of England, Austria, Spain, United States, Cape of Good Hope, and of a Second Russian Standard, made at the Ordnance Survey Office, Southampton.

THE ROYAL SOCIETY OF LONDON.

Zoological Society of London, Transactions, Vol. VIII, Parts 4-5.

Part V. *P. M. Duncan*.—A Description of the *Madreporaria* dredged up during the Expeditions of "H. M. S. Porcupine" in 1869 and 1870.

THE ZOOLOGICAL SOCIETY OF LONDON.

Geological Society, Quarterly Journal, No. 114.

THE GEOLOGICAL SOCIETY OF LONDON.

Statistical Society, Journal, Part I, 1873.

THE STATISTICAL SOCIETY OF LONDON.

Royal Geographical Society, Proceedings, Vol XVII, No. 2.

*Goldsmid*.—Journey from Bunder Abbas to Mash'had by Sistun. *Raebelson*.—Notes on Seistan. *Raebelson*.—On Badakshan and Wakhán.

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

Institution of Mechanical Engineers, Proceedings, May, 1873.

*C. W. Cooke*.—On Wenham's Heated-Air Engine.

THE INSTITUTION OF MECHANICAL ENGINEERS, BIRMINGHAM.

Anthropological Institute, Journal, Vol. III, No. 1.

*W. L. Distant*.—The Inhabitants of Car Nicobar. *Sir Duncan Gibb*.—On the Looshais.

THE ANTHROPOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.

East Indian Association, Journal, Vol. VII, No. 1.

THE EAST INDIAN ASSOCIATION OF LONDON.

Hand-List of the Specimens of Shield Reptiles in the British Museum by Dr. J. E. Gray.—Catalogue of the specimens of *Hemiptera Heteroptera* in the British Museum, Parts VII, and VIII, by F. Walker.—Catalogue of the Syriac Manuscripts in the British Museum, by W. Wright.

THE TRUSTEES OF THE BRITISH MUSEUM.

Journal Asiatique, VII<sup>e</sup> Série, No. 3.

*M. B. Renan*.—Note sur deux inscriptions Nabatéennes. *Ch. Bruston*.—L'inscription de Dibon, traduite et annotée. *M. Ad. Neubauer*.—Un Commentaire Samaritain inconnu.

THE ASIATIC SOCIETY OF PARIS.

Société Anthropologique, Bulletins, 11<sup>e</sup> Série, Tome VIII, Fasc. I.

*De Quatrefages*.—Sur les populations du bassin de l'Amour. *Faidherbe*.—Sur les dolmens d'Afrique.

THE ANTHROPOLOGICAL SOCIETY OF PARIS.

Société Géographique, Bulletin, Juin, 1873.

*Khiva* (Extrait d'un article du Colonel Venioukof), (suite et fin).—Esquisse du pays à l'est de la mer Caspienne et de la mer d' Aral.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Académie National des Sciences de Bordeaux. Actes, 3<sup>e</sup> Série, 34<sup>e</sup> Année, Trimestres 1-2.

THE NATIONAL ACADEMY OF SCIENCES, AND ARTS OF BORDEAUX.  
Société Royale des Sciences de Liège. Mémoires, 2<sup>me</sup> Série, Tome 3.

J. Sichel.—Considérations zoologiques sur la détermination de l'espèce. E. Charlier.—Observations de tératologie.

THE ROYAL SOCIETY OF SCIENCES OF LIE'GE.

Monatsbericht, Februar, März und April, 1873.

März und April. Lepsius.—Über Magnet und Eisen bei den alten Aegyptern. Weber.—Über das Mahābhāshya des Patanjali, nach der im vorigen Jahre in Benares erschienenen Ausgabe.

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN.

Norges Officielle Statistik, udgireen i Aaret 1869-1872.—Criminal statistiske Tabeller for Kongeriget Norge for Aaret 1865, 1866, 1868, 1869, 1870.—Fattig-Statistik for 1867, 1868, 1869.—Beretning om Skolere Afsættets Tilstand, for 1867, 1868, 1869, 1870.—Tabeller Vedkomende Skiftevæsenet i Norge, 1868, 1869, 1870.—Oversigt, 1869, 1879.—Den Norske Statstelegrafs Statistike for 1869, 1879.—Kommunale Forholde i Norges land—og By Kommuner, 167-68.—De Offentlige Jerubauer, 1871.—Tabeller vedkommende Norges Handel og Skibsfart, 1868, 1869, 1870, 1871.—Beretninger om Amternes Œconomiske Tilstand, 1866-70.—Tabeller vedkommende Falkenmængdens Bevægelse, 1856-65.

Lappisk Mythologi, J. A. Friis. Den Norske Lodo, udgiven af den Geografiske opmaaling, Hefte 1. Den Norske Turistforenings Arbog for 1871. Forhandlinger i Videnskabs Selskabet i Christiania, aar 1871. Nyt Magazin for Naturvidens kaberne, xix, 1 og, Hefte 2. Statistisk Handbrog for Kongeriget Norge. On the Rise of land in Scandinavia by S. A. Sexe. Recherches sur la Chronologie E'gyptienne, par J. Lielbein. On some remarkable forms of Animal Life, from the great deeps, off the Norwegian Coast, by G. O. Sars. Forekomster af Kise i Visse Skifere i Norge, ved E. B. Münster Carlinologiske Bidrag til Norges Fauna, af G. O. Sars, (mysider). De Skandinaviske og Arktiske Amphipoder, af Axel Boeck. Die Pflanzenwelt Norwegens, von Dr. F. C. Schübeller. Anvisning til Konstruktion af Lystfarløler og Bade, af, C. Archer. Norsk Meteorologisk Aarbag for 1871.

THE ROYAL UNIVERSITY OF NORWAY, CHRISTIANIA.

Bulletin, Tome XLVI, Nos. 3, 4.

No 3. N. Lubimoff.—Neue Theorie des Gesichtsfeldes und der Vergrößerung der optischen Instrumente. Victor Motschoulsky—Énumération des nouvelles espèces de coléoptères rapportés de ses voyages. (Contains notices of some Indian species).

THE IMPERIAL SOCIETY OF NATURALISTS, MOSCOW.

Bijdragen tot de Taal-Land-en Volkenkunde, 3<sup>e</sup> Volgr., Deel VII, Stuk 1, 2.

St. 1. *Dr. J. Pijnappel.*—Over de kennis, die de Arabieren voor de komst der Portugeezen van den Indischen Archipel bezaten. *Dr. J. Pijnappel.*—Eukole Aanmerkingen op Wallace's Insulinda.

THE ACADEMY OF SCIENCES OF NETHERLANDS-INDIA.

Proceedings, Parts 1-3, 1872.

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Calcutta Journal of Medicine, July 1873.

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Holi, Devi-Chhadam Lilá, Premásru-varshan, Prema-phula várí, Phulon-ká-Guechhlá, Vedic killing is not a killing, Jaina-Kutlhalá, Vidyásundara Nataka, Agaryálon-ki utpatti, Sujána-Satak, by Harischandra.

THE AUTHOR.

Pákhanda Vidamvana, by Kaví Kishna.

Sundarí-Tilaka, by Mannulala.

Gopála-lilá-kávyam, by Rámachandra.

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Nidana, translated by Udayachanda Datta.

THE TRANSLATOR.

A Travel to Western India, by Kedar Nath Dass.

THE AUTHOR.

Grammar of the Bengali Language, by W. Carey.

BA'BU RA'JENDRALA'LA MITRA.

Minutes of the Trustees of the Indian Museum, April 1872 to March 1873.

THE TRUSTEES OF THE INDIAN MUSEUM.

Catalogue of MSS. from Gujrát, No. 4.

THE GOVERNMENT OF BOMBAY.

Report on the Meteorology of the Panjáb for 1872.

THE GOVERNMENT OF THE PANJA'B.

Report of the Calcutta Medical Institutions for 1872.

THE GOVERNMENT OF BENGAL.

Lahore to Yarkand, by G. Henderson and A. O. Hume.

Flora Sylvatica, by Beddome, Part XVII.

THE GOVERNMENT OF INDIA.

The Indian Antiquary, August, 1873.

Major J. W. Watson.—Story of Rani Pingala.

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*Purchase.*

The Quarterly Review, Nos. 267, 268, 269.

No. 268. Central Asia.

The Westminster Review, January, April and July, 1873. Nos. 85—87.

No. 87. Emigration and the Coolie Trade in China.

The Quarterly Journal of Science, January, April, July, 1873. Nos. 37—39.

No. 37. W. Crookes.—On the probability of Errors in Experimental Researches.—

H. A. Proctor.—Condition of the Moon's surface. A solution of the Sewage Problem.—

No. 38. Atmospheric Life Germs. Capt. S. P. Oliver.—The Dolmen mounds and Amorpholithic monuments of Brittany.

No. 39. M. Ponton.—Actinism and Magnetism. W. W. Wood.—The Mineral Riches of the Philippines.

The Edinburgh Review, Nos. 279, 280, 281.

No. 279. The Administration of Berar.

No. 280. Trade Routes to Western China

No. 281. Recent events in Afghanistan.

The Annals and Magazine of Natural History, Vol. II. Nos. 61—68. January to August, 1873.

No. 61. R. Swinhoe.—On a new species of *Nettapus* (cotton-teal) from the river Yangtze. M. F. Plateau—Physico-chemical Investigations upon the Aquatic *Articulata*. O. C. Marsh.—Notice of new and remarkable Fossil Birds.

No. 62. E. B. Lankester.—Summary of Zoological observations made at Naples in the winter of 1871-72. Dr. J. E. Gray.—Notes on Tortoises. Dr. J. E. Gray.—On a new Freshwater Tortoise from Borneo (*Orlitia borneensis*).

No. 63. Dr. J. E. Gray.—On the original Form, Development and Cohesion of the Bones of the Sternum of *Chelonians*, with Notes on the skeleton of *Sphargis*. H. J. Carter.—On Whales in the Indian Ocean. O. C. Marsh.—On a new Sub-class of Fossil Birds. Dr. J. E. Gray.—On two new Free Sponges from Singapore. A. Schneider.—On the developmental History of *Petromyzon*.

No. 64. Professor Ernst Haeckel.—On the *Callispongias*, their position in the Animal kingdom and their relation to the Theory of Descendence. Dr. J. E. Gray.—Observations on Pigs (*Sus*, Linnaeus; *Setifers*, Illinger); and their skulls, with the description of a new species. F. Smith.—Description of a new Species of Fossorial *Hymenoptera* in the collection of the British Museum.

No. 65. E. Ray Lankester.—On the Primitive Cell-layers of the Embryo as the bases of Genealogical classification of animals, and on the origin of Vascular and Lymph systems. H. J. Carter.—Points of distinction between the *Spongiadae* and the *Foraminifera*. Dr. J. E. Gray.—On the definition of *Rhinoceroses* (*Rhinocerotidae*) and on the characters afforded by their skulls. E. Favre.—On some works relating to a new classification of *Ammonites*.

No. 66. Alphonse de Candolle.—On the advantage of a Dominant Language for Science. Dr. A. Günther.—Contribution to our knowledge of *Ceratophrys* and *Megalophrys*.

No. 67. W. King.—On some characters of *Lingula anatina* illustrating the study of Fossil Palliobranchs. H. J. Carter.—On two new species of *Gummineae* with special and general observations. Dr. J. E. Gray.—Description of two new Species of Bush-buck (*Cephalophus*) from Western Africa. A. W. E. O'Shaughnessy.—Herpetological Notes. J. Wood-Mason.—On *Nephropsis Stewarti*, a new genus and species of

Macrurous Crustaceans, dredged in deep water off the Eastern Coast of the Andaman Islands. *Dr. J. E. Gray.*—Notes on the Family *Chelydromæ*. *T. Gill.*—Note on the *Scombrocottus salmoneus* of Peters, and its identity with *Anoplopoma fimbria*. *Dr. F. Kuvass.*—The skeleton of *Sphargis coracla* from Surinam. *Dr. J. E. Gray.*—*Danonia unicolor*, a new species of Water-Tortoise from China, sent by Mr. Swinhoe. *M. Baray.*—On *Hylodes Martinicensis* and its Metamorphoses.

No. 68. *A. G. Butler.*—Answer to Dr. Stoliczka's Notes on Indian species of *Thelyphonus*. *A. G. Butler.*—A monographic Revision of the genus *Phrynus* with descriptions of four remarkable new species. *H. W. Bates.*—On the Longicorn Coleoptera of Japan. *Dr. J. E. Gray.*—Notes on Chinese land-Tortoises (*Trionychia*), with the description of a new species. *Dr. J. E. Gray.*—On the Decr of the West Coast of South America, with the Description of a new species from Peru. *Royal Society.*—*Dr. W. Kowalewsky* on the Osteology of the *Hyopotamidae*. *Dr. J. W. Gray.*—On the Skull of the spectacled Bear of Peru and of the *Helarctos* from Malacca and Java. *Dr. J. E. Gray.*—On the Skeleton of *Kogia Macleayi*. *Dr. J. E. Gray.*—On a Salamander from Shanghai.

The London, Edinburgh and Dublin Philosophical Magazine, January—August, 1873. Nos. 297—304.

No. 298. *O. Heaviside.*—On the best arrangement of Wheatstone's Bridge for measuring a given resistance with a given Galvanometer and Battery.

No. 299. *T. P. B. Warren.*—On a method of testing Submarine Telegraph Cables during Paying-out.

No. 300. *O. Heaviside.*—On an advantageous method of using the Differential Galvanometer for measuring small Resistances. *L. Schwendler.*—On Differential Galvanometers (Reprint from Journal Asiatic Society of Bengal). *A. S. Davis.*—The Vibrations which Heated Metals undergo when in Contact with Cold material, treated mathematically.

No. 301. *A. M. Mayer.*—On the effects of Magnetization in changing the Dimensions of Iron, Steel and Bismuth bars, and in increasing the interior capacity of hollow Iron Cylinders.

No. 302. *O. Heaviside.*—On Duplex Telegraphy. *H. Wilde.*—On some improvements in Electromagnetic Induction Machines.

No. 304. *J. W. S. Glaisher.*—On the form of the Cells of Boes.

Journal of the Chemical Society, 1873, May—July.

May. *J. H. Gladstone* and *A. Tribe.*—Researches on the Action of the Copper-zinc Couple on Organic Bodies. *J. H. Gladstone* and *A. Tribe.*—Observations on the Nature of the Black Deposit on the Copper-zinc Couple.

June. *H. Sprengel.*—A Method of determining the Specific Gravity of Liquids with ease and great exactness.

July. *Dr. C. W. Siemens.*—On smelting Iron and Steel.

The Numismatic Chronicle, 1873 Parts 1-2.

Part I. *S. E. L. Poole.*—On Mint characteristics of Arabic coins.

Part II. *S. E. L. Poole.*—On the coins of the Muwahhids in the British Museum.

The Ibis, 1873, January, April and July. Nos. 9—11.

No. 9. *R. Swinhoe.*—On a new species of Little Bittern from China. *A. Anderson.*—On the Nidification of certain Indian Birds. *E. Blyth.*—Addenda to the Avifauna of India. *Dr. J. Murie.*—Fragmentary Notes on the Guacharo or Oil-bird

(*Stentornis Caripensis*). W. T. Blanford.—Descriptions of new species of *Nectarinia* *Sitta* and *Parus* from Persia and Baluchistan.

No. 10. Capt. J. H. Lloyd.—On a new species of Barbet from Western India P. L. Selater.—Note on the *Pyrranga roseogularis* of Cabot. R. Swinhoe.—On a new Chinese Owl of the genus *Ketupa*. R. B. Sharpe.—On the genus *Platystira* and its Allies. T. Salvadori.—Note on *Homocheilamys lusciniæ*, Salvad. Dr. J. Murie.—On the *Upipidæ* and their relationships. W. T. Blanford.—Notes on "Stray Feathers," W. T. Blanford.—Description of a new Jay and a new Woodpecker from Persia.

No. 11. R. Swinhoe.—On the Rosy Ibis of China and Japan (*Ibis nippon*). J. E. Harting.—On a rare or little known *Limicola*. O. Salvin and D. G. Elliot.—On two species of *Trochilidæ* of the Genus *Lophornis*. G. N. Lawrence.—Remarks on *Neomorphus pucherani* and its Allies. Arthur Viscount Walden.—On a Collection of Birds recently made by Lieut. R. W. Ramsay.

Revue des Deux Mondes, 1873, Jan.—Aout.

15 Fev. M. Jules Clardé.—Orissa, une Province Anglaise de L'Inde.

15 Mars. Le Japon depuis l'abolition du Taicounat, les réformes et les progrès des Européens. M. A. Vambery.—Les Russes dans L'Asie Centrale.

15 Juillet. M. F. Papillon.—Les nouvelles matières explosives d'après les plus récents Travaux. La Guerre de Sumatra.

Revue Archéologique, 1873, Jan.—Juillet. Nos. 1—7.

No. 2. M. F. Lenormant.—La plus ancienne inscription en langue Assyrienne.

No. 5. M. G. Maspero.—Sur la Stèle de l'intronisation trouvée au Djebel-Barkal.

Revue et Magasin de Zoologie, 1873, Nos. 1—8.

Journal des Savants, 1873, Jan.—Juillet.

Mai. M. Chevreul.—La vérité sur l'invention de la photographie.

Juin. M. C. Desfermery.—Mémoires de Baber.

Comptes Rendus, Tome 76, Nos. 1—16, Tome 77, Nos. 1—4.

No. 2. M. Picot.—Sur les propriétés antifermentescibles du silicate de soude.

No. 3. M. O. Tamin-Despalles.—Rapport entre les observations ozonométriques et la mortalité.

No. 5. M. Becquerel.—Mémoires sur les piles électro-capillaires à courant constant. P. Secchi.—Sur les protubérances et les taches solaires.

No. 6. M. Th. du Moncel.—Note sur les conditions de maximum de la résistance des galvanomètres. MM. A. Laussedat et A. Mangin.—Sur l'emploi du Baromètre anéroïde de poche et d'une nouvelle formule hypsométrique d'une grande simplicité. M. Faye.—Explication des taches solaires.

No. 8. M. Dumas.—Rapport verbal sur un ouvrage de M. Fyner intitulé "Histoire des Serpents venimeux de l'Inde ou "The Thanotaphidia of India".—M. J. Raulin.—Sur la maladie des vers à soie. MM. L. Troost et P. Hautefeuille.—Recherches sur la dissolution des gaz dans la fonte, l'acier et le fer. (Continued in No. 9.)

No. 10. M. A. Béchamp.—Sur les microzymas normaux du lait, comme cause de la coagulation spontanée, et de la fermentation alcoolique et acétique de ce liquide.

No. 11. M. Janssen.—Passage du Vénus; méthode pour obtenir photographiquement l'instant des contacts, avec les circonstances physiques qu'ils présentent.

No. 13. M. J. Jamin.—Sur la théorie de l'aimant normal et sur le moyen d'augmenter indéfiniment la force des aimants. M. A. Béchamp.—Sur l'alcool et l'acide acétique normaux du lait, comme produits de la fonction des microzymas.

No. 14. M. Becquerel.—Mémoires sur les piles et actions électro-capillaires.

No. 15. *M. Charles*.—Explication du texte d'Aboul Wefa sur la troisième inégalité de la Lune. *M. Th. du Moncel*.—Note sur les effets produits par les courants sur le mercure immergé dans différentes solutions. *P. Secchi*.—Notices sur le climate de la Chine.

No. 18. *M. Th. du Moncel*.—3e Note sur les effets produits par les courants électriques sur le mercure immergé dans différentes solutions. *MM. A. Béchamp et A. Estor*.—Faits pour servir à l'histoire des microzymas et des bactéries. Transformation physiologique des bactéries en microzymas, et des microzymas en bactéries, dans le tube digestif du même animal.

No. 20. *M. Tresca*.—Note sur les propriétés mécaniques de différents bronzes.

No. 22. *M. Puisseur*.—Note sur le passage de Vénus devant le soleil en 1882. *P. Secchi*.—Essai pendant une éclipse solaire de la nouvelle méthode spectroscopique proposée pour le prochain passage de Vénus.

No. 24. *M. E. Peligot*.—Sur les alliages employés pour la fabrication des monnaies d'or.

No. 25. *P. Secchi*.—Nouvelle série d'observations sur les protubérances solaires; remarques sur les relations qui existent entre les protubérances et les taches.

No. 26. *M. Tacchini*.—Nouvelles observations constatant la présence du magnésium sur le bord entier du Soleil.

Tome 7. No. 1. *M. P. Bouilland*.—Nouvelles recherches cliniques sur la localisation dans les lobes cérébraux antérieurs de l'action par laquelle le cerveau concourt à la faculté psycho-physiologique de la parole. *M. Liehtebot*.—Sur la chaleur de combinaison rapportée à l'état solide; nouvelle expression thermique des réactions. *M. E. Vicaire*.—Sur la constitution du Soleil et la théorie des taches. *M. H. Tarry*.—Les Cyclones du Soleil comparés à ceux de notre atmosphère. *M. E. Delporte*.—Déconverte des makis et du cheval, à l'état fossiles dans les phosphorites du Lot.

No. 2. *M. Becquerel*.—Sur le mode d'intervention de l'eau dans les actions chimiques pendant le mélange des solutions salines neutres, acides et alcalines. *M. Th. du Moncel*.—Note sur le magnétisme. *M. M. Raux et Sarrau*.—Sur la chaleur de combustion des matières explosives.

No. 3. *P. Secchi*.—Sur les spectres du fer et de quelques autres métaux, dans l'arc voltaïque. *M. Tacchini*.—Nouvelles observations spectrales, en désaccord avec quelques-unes des théories émises sur les taches solaires. *M. Th. Schloesing*.—Etude de la nitrification dans les sols. *M. Jacquemin*.—L'acide pyrogallique en présence de l'acide iodique.

No. 4. *M. C. Sédillot*.—De la galvanocautie thermique ou électro-thermique, appliquée aux opérations chirurgicales. *P. Secchi*.—Nouvelles recherches sur le diamètre solaire. *M. C. Flammarion*.—Sur la plante Mars.

The American Journal of Science and Arts, Vol. V, Nos 25—31.

January—July, 1873.

No. 25. *J. W. Draper*.—Researches in actino-chemistry. On the distribution of Chemical Force in the Spectrum. (Concluded in No. 26).

No. 26. *O. C. Marsh*.—On the gigantic fossil Mammals of the Order Dinocerata.

No. 27. *O. N. Rood*.—Observations on the duration and multiple character of Flashes of Lightning. *A. M. Mayer*.—On the effects of Magnetization in changing the dimensions of Iron, Steel and Bismuth bars. (Part I).

No. 28. *A. M. Mayer*.—On a simple device for projecting on a screen the deflections of the needles of a Galvanometer. *O. C. Marsh*.—Additional observations on the *Dinocerata*.



No. 29. *J. D. Dana*.—On the Origin of Mountains. *C. S. Hastings*.—Comparison of the Spectra of the Limb and of the centre of the Sun, made at the Sheffield Scientific School. *J. Trowbridge*.—Induced currents and derived circuits. *F. H. Bigelow*.—On a method of measuring induced currents. *N. D. C. Holges*. On methods of determining the resistance of a battery, deduced from Poggendorff's mode of measuring Electromotive Forces.

No. 30. *J. D. Dana*.—On some results of the Earth's contraction from cooling, including the origin of Mountains and the nature of the Earth's interior. (Continued in No. 31.) *C. A.*

*Young*.—Note on the use of a diffraction "grating" as a substitute for the train of prisms in a Solar Spectroscope.

No. 31. *O. N. Rood*.—A convenient Eye-piece Micrometer for the Spectroscope.

Hewitson's Exotic Butterflies, Nos. 85 and 86.

Dr. Pott's Etymologische Forschungen, Band 4.

Huxley's Critiques and Addresses.

I. Administrative Nihilism. II. The School Boards. III. On Medical Education. IV. Yeast. V. On the formation of Coal. VI. On Coral and Coral Reefs. VII. On the methods and Results of Ethnology. VIII. On some fixed points in British Ethnology. IX. Palaeontology and the Doctrine of Evolution. X. Biogenesis and Abiogenesis. XI. Mr. Darwin's Critics. XII. The Genealogy of Animals. XIII. Bishop Berkeley on the Metaphysics of Sensation.

Max Müller's Introduction to the Science of Religion.

### *Exchange.*

The Athenæum, July, 1873.

Nature, Nos. 197—204.

PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR DECEMBER, 1873.

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The Monthly General Meeting was held on Wednesday, the 3rd instant, at 9 P. M.

The Hon. J. B. Phear, Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

The receipt of the following presentations was announced—

1. From the author, a copy of a work entitled "A Phrenologist amongst the Todas," by Lieut.-Col. W. E. Marshall, B. S. C.

2. From the author, a copy of a pamphlet entitled "Substances used for Food, Drink and Smoking by the natives of Bengal," by Bābū Pratāpa-chandra Ghosha.

3. From the author, a copy of "The Prosody of the Persians," by H. Blochmann, Esq. M. A.

The following gentlemen duly proposed and seconded at the last meeting were balloted for and elected ordinary members:—

J. Sykes Gamble, Esq.

H. H. the Maharaja of Johor, K. C. S. I.

M. L. Dames, Esq., C. S.

B. O'Brien, Esq., M. D.

J. Elliott, Esq.

J. Blackburn, Esq.

K. McLeod, Esq., M. D.

The following are candidates for ballot at the next meeting—

C. F. Magrath, Esq., C. S., proposed by H. F. Blanford, Esq., seconded by C. H. Tawney, Esq.

J. L. Peppé, Esq., proposed by J. H. Peppé, Esq., seconded by Col. E. T. Dalton, C. S. I.

C. Heintze, Esq., proposed by H. Blochmann, Esq., M. A., seconded by Captain Waterhouse.

The following gentlemen have intimated their desire to withdraw from the Society.—

R. T. H. Griffith, Esq.

Captain T. H. Lewin.

The Hon. R. Spankie.

Dr. J. B. Baxter.

R. B. Smart, Esq.

The Council reported that Messrs. H. B. Medlicott and J. Geoghegan had been elected Members of Council in place of the Hon. Sir R. Couch and J. Westland, Esq., resigned.

The Chairman announced that the Council had, on the recommendation of the Philological Committee, sanctioned the publication of the *Aitareya Aranyaka*, and the *Brihaddhevata* in the *Bibliotheca Indica* at the suggestion of Prof. Max Müller.

The Council also reported that 24 oil paintings belonging to the Society's collection, comprising the majority of the portraits of by-gone members of the Society, with a few of the valuable paintings by Rubens and other old masters, had been put into the hands of Mr. D. Garrick to be cleaned and repaired at a cost of about Rs. 1,075. This step was rendered absolutely necessary by the very bad condition of many of the paintings, and should have been done long ago had the funds of the Society permitted it.

The Chairman announced that it was proposed to hold a series of lectures on popular science and subjects connected with India, during the cold season and that arrangements had been made for commencing the series by a lecture on "Recent Discoveries in Spectrum Analysis," by A. Pedler Esq. Lectures had also been promised by—

The Hon. J. B. Phear—"On Glimpses of old India through the pages of Manu."

Mr. H. F. Blanford—"On the Winds of Northern India."

Mr. Blechmann—"On Thoughts and Ideas peculiar to the East."

Mr. J. Wood-Mason—"On Embryology."

Bábu Rájendralála Mitra—"On Recent Oriental Researches."

The sequence of the lectures had not yet been finally arranged, but it was proposed to hold two lectures in January and February, and one or more in March.

On account of the extremely limited space at the Society's disposal, it had been found necessary to limit the number of tickets to 200. As there were about 130 resident members in Calcutta, it was not possible to give each member two tickets, one for himself and one for a friend. The Council had therefore arranged that one ticket should be sent to each resident member, and that members who required another ticket, should obtain one

more on application to the Secretary, as far as they were available, and further that those members who did not intend to make use of their tickets either for themselves or for a friend, should be begged to return them in order that they might be available for others. The Council trusted that members would assist them in carrying out these arrangements, so that the inconveniences arising from the want of a larger hall might be felt as little as possible.

The lectures would be open to ladies.

Capt. J. Waterhouse exhibited some photographic prints produced by the collotype process and pointed out the advantages of the process as a substitute for the ordinary methods of photographic and lithographic printing and engraving.

Mr. Blochmann exhibited the following inscriptions received from General Cunningham, C. S. I.

#### Dihlí.

##### I.

*Inscription from the tomb of the renowned Shaikh Farid i Bukhári.*

A biography of this excellent man will be found in my *Ain* translation, pp. 413, 620. The town of Faridábád, south of Dihlí, is called after his name, and numerous buildings erected by him still exist in Bihár, Dihlí, Faridábád, Láhor, and Ahmadábád. The inscription consists of fourteen lines, and the slab measures 7 feet by 1½ feet.

يا الله • سبحان الملك الحي الذي لا يموت ولا يفوت - در زمان دوات حضرت  
 عرش آشیانی جلال الدین اکبر پادشاه غازی شیخ فرید ابن میدان احمد بخاری  
 بعذایات آنحضرت ممتاز بود و در عهد عدالت نور الدین جهانگیر پادشاه ابن اکبر  
 پادشاه بخطاب مرتضیٰ خانی مرافراز گردید تاریخ سنه ۹ جلوس مطابق سنه ۱۰۲۵  
 هجری برحمت الهی پیوست •

مرتضیٰ خان چو بحق و اعل شد • گشت اقلیم بقا مفدوحش  
 بهر تاریخ ملائک گفتند • باد پر نور الهی روحش

O God!

Wonderful is the King, the Living, who neither dies, nor passes away.

In the reign of 'Arsh-ashyānī Jalāl-ud-dīn Akbar Padishāh i Ghāzī, Shaikh Farid, son of Sayyid Ahmad Bukhāri, was distinguished by the favors of that monarch, and during the just rule of Nūr-uddīn Jahāngir Padishāh, son of Akbar Padishāh, he was honored with the title of Murtazā Khān.

In the 9th year of the accession, corresponding to 1025 A. H.,\* he joined God's mercy.

\* It is curious that a chronological mistake should occur on the tombstone of so famous a man as Farid i Bukhāri. The ninth year of Jahāngir's reign lasted from 9th Safar, 1023, to 17th Safar, 1024. But the *tārīkh* of Farid's death given in the *Ain*

1. When Murtazá Khán joined God, the realm of futurity was opened to him.
2. The angels proclaimed the following *tárikh*, '*bád pur núr i iláhi ráhsh*,' 'May his spirit be full of divine light!'

## II.

The following inscription General Cunningham found on a marble tomb outside the 'Aláí Darwázah, Quṭb, Dihlí. It consists of four lines, and is 3 feet long and 13 inches broad.

The inscription, which reads like the preface of a Manuscript, records the building by some saintly Sayyid of the vault which he had destined for his own resting place.

بسم الله الرحمن الرحيم وظيفة حمد ودعائى كه مجاوران خطيره قدس  
و ساكنان روضه انس بآن قيام نمايند نثار خداوند كه متهديان درگاه او  
دنيا و آخرت را فدائى راه او نموده و نقد جان و دل پيكر آب و گل را  
صرف بارگاه او فرموده و درون و افرو و تحقيقات متمكنازه بمشهد معطر و خطيره  
منور شفيق روز محشر و آل و اصحاب اطهر او واصل و متواصل باد و بحضورت  
موفى الخيرات و ميسر البريات توفيق ازلى را رفيق حضرت هدايت  
مرتبت محمد محمدت على صفوت حسيني مشرب حسيني نسب  
عمده سادات عظام خلاصه اتقا كرام عيسى عالم ترك و تجريد موسى  
كوه عزلت و تفريد المؤيد من عند الله الغنى قطب الملة و الطريقة سيد  
حسنى الحسينى گردانيد تا اين بقعه شريف و منزل لطيف را احداث  
نمود كه چون مدت حياتش كه بذيل قيامت پيوند باد بسر آيد و بتشریف  
ادخلوها بسلام آمدين مشرف گردیده بسوى خطيره قدس و روضه انس  
پرواز نمايد مقبره فايز الانوار آن حضرت اين بقعه نامدار باشد و كان اتمام  
هذه البقعة فى شهر ذى القعدة در سنة اربع و اربعين و تسعمائة ۱۱

In the name of God, the Merciful, the Clement!

Praise and prayer such as the angels near the dome of holiness and the dwellers in the gardens of love are daily engaged in, be my offering to God, on whose road the worshippers of the heavenly throne willingly give up earthly pleasures and the rewards of future life; and peace without end and numerous blessings on the fragrant spot and shining tomb of the Intercessor on the day of resurrection, and on his pure family and friends, for ever and ever. And through the Prophet, the giver of benefits and the bestower of piety, God, in His eternal will, has permitted him (the builder),—who holds the rank of a guide, resembles Muhammad in praiseworthiness, is an 'Alí in purity, possesses the

leaves no doubt that he died in 1025; hence he died either in the end of the 10th or in the 11th year of Jahāngir's reign. The 11th year commences on the 1st Rabī' I, 1025.

character of Husain, and is descended from Husain, a noble scion of the great Sayyids, the essence of trustworthy great men, who in his contempt of the world is a Jesus, and in his retirement like Moses on the Mount of Solitude, who is assisted by the Almighty, the pole of the faith and the way, a Hasaní and Husainí Sayyid,—to found this noble edifice and pleasant building; and it is his last will that, when the term of his life (may it stretch to the day of resurrection!) come to an end and when honored with the call, 'enter, ye faithful, in peace, amen!' he will take his flight to the dome of holiness and the gardens of love, this noble vault be his shining tomb.

This vault was completed in Zí Qa'dah, 944 [April, 1538, A. D.].

### Bada'on.

#### I.

The following inscription was found by General Cunningham on the northern door of the Jámí' Masjid of Badáon. It does not seem to refer to the building of a mosque. At least the word 'masjid' is not mentioned.

The inscription is of value, because it belongs to the very beginning of Muhammad ibn Tughluq's reign.

The stone measures 2 feet 7 inches by 1 foot 6 inches.

امر هذه العمارة الحضرة الاعلى ظل الله الرحمن ابوالمجاهد بن تغلق  
شاه السلطان خلد الله ملكه و سلطانه في سنة ست و عشرين و سبعمائة  
معمارة حسين \* \* كوتوال بخطه بداون اا

This edifice was ordered to be built by his high majesty, the shadow of God, the merciful, Abul Mujáhid, son of Tughluq Sháh, the king,—may God perpetuate his kingdom and rule! In the year 726. The architect is Husain\* \*, Kotwál in the District of Badáon [A. D. 1326].

#### II.

The next inscription refers to the building of Quṭb-uddín's Jámí' Mosque in Badáon. Quṭb-uddín was Jahángir's foster brother, and was killed at Bardwán by Sher Afkan, Núr Jahán's first husband. *Vide* Aín translation, p. 496, where his son Ibráhm Kishwar Khán is also mentioned.

در عهد جلال الدين محمد اكبر پادشاه غازى سنه ۱۰۱۳ هزار و سیزده بنا كرد  
ابن مسجد قطب الدين خان چشتى عرف شيخ خوبو كوكنه ابوالمظفر سلطان  
سليم شاه غازى ابن جلال الدين محمد اكبر شاه باقتمام نواب شيخ ابراهيم ولد  
خان مذكور كاتب عمارت عبد الملك قاضى اا

In the reign of Jalál-uddín Muhammad Akbar, Pádisháh i Ghází, anno 1013, this Mosque was erected by Quṭb-uddín Khán Chishtí, commonly known as Shaikh Khúbú, the foster brother of Abul Muzaffar Sultán Salim Sháh i Ghází, son of Jalál-uddín Muhammad Akbar Sháh, under the superintendence of Nawáb Shaikh Ibráhm, son of the above mentioned Khán. The writer of the edifice is 'Abdul Malik Qází.

The inscription consists of two lines separated by a thick stroke, at the end of which there is a royal umbrella, and is 5 feet long and 11 inches broad. The short sides are *mihrábí* (Aín translation, p. 30, note 2).

This inscription is also given in the 'Tárikh i Badáon,' or 'Chronicle of the Town of Badáon,' by Bakhtáwar Singh, Sub-Judge of Gorákhpúr (printed by the Rohilk'hand Literary Society, Svo., 84 pp., 1868, in Urdú), where it is said that the slab stands to the right of the Mitráb. To the left of it stands the following (metre, short *Hazaj*).

## III.

بنای خان قطب الدین مرحوم \* شدہ محکم بحکم خان کشور  
بقصد شیخ فیض اللہ چشتی \* چو شد اتمام با صد زینت و فر  
ہی تابیع او گفتم خرد را \* ز جان گو خالقا اللہ اکبر

1. The building of the late Qutb-uddín Khán was firmly erected by Kishwar Khán's order.

2. When through the care of Shaikh Faiz-ullah i Chishtí, it was with every grandeur completed,

3. Thought told me to say from my heart as *tárikh* the words '*khalíqá alláhu akbar*,' 'O Creator! God is great.'

The value of the letters of the *tárikh* is 1021, i. e., A. D. 1612.

The inscription measures 4 feet by 14 inches.

The Ilitmish inscription of 628 [A. D. 1230] and the 'Álam Sháh inscriptions at Badáon were published in the Journal, for 1872, Pt. I, p. 110.

#### ✓ Champanagar, near Bhágalpúr, Bihár.

The following inscription was found by General Cunningham at a Dargáh, called the *Maskan i Barári*, or 'domicile of virtues,' where some Sunní 'Makhdúm,' or saint, is buried.

The slab measures 2 feet 4 inches by 15 inches, and contains three lines.

لا إله إلا الله محمد رسول الله • ابوبكر صديق رضى الله عنه || عمر فاروق  
رضى الله عنه || عثمان رضى الله عنه || على كرم الله وجهه •  
چون اضعف عباد الله خواجه احمد سمرقندى حسب الحكم نواب قدسي القاب  
شاهزاده عالميان شاه پرويز جه نكبر بخدمت فوجدار سركار منگير آمده بود به بنای  
عمارت ابن روضه منوره توفيق يافت سنه هزار و سی و دو ۱۰۳۲ ||

(The Muhammadan creed, and the names of the four Khulafas.)

When the weakest of the slaves of God, Khwájah Ahmad Samarqandí, by order of the distinguished Nawáb, the Prince of the people of the world, Sháh Parwíz, son of Jahángír, was appointed Faujdár of Sirkár Munger, he found grace to build this shining vault. A. H. 1032 [A. D. 1622-23].

#### Kanauj.

"East of the town of Kanauj," says Mr. T. W. Beale in his *Miftáh-uttawárikh* (p. 127)," there is a Dargáh, near the old fort, on an eminence. Inside are two vaults built of red and white stone. One of them had an

inscription with a date, but the letters were illegible or had broken away. The people living at the place say that the children of Makhúm Jahániyán are buried here. Near their vault is a mausoleum with a high dome and four minarets, and inside are four tombs, without inscription; but in a corner stood a large stone, which had formerly been attached to the doorway. From the inscription on it, it is clear that in 881 A. H., or 1476 A. D. during the reign of Husain Sháh of Jaunpúr, one Sháh Harí Khán, son of Fath Khán, built the mausoleum."

Mr. Beale then gives an imperfect reading of the inscription. General Cunningham took a photograph of the slab, which I read as follows:—

این سده بدیع که از چرخ برترست • رین طاق بنظیر که بازب و زورست  
گشته بنا بعد همایون حسین شاه • کاندز زماه ذات جلالش مظفرست  
ترتیب کرد شاه هری خان فتح خان • کز فضل حق جهان همه اورا مسرورست  
بادا هزار سال حیانش بکام ملک • کین ملک بر دوام بذانش مقررست  
هشدار و یک و هیصد از هجرت رسول • تاریخ ثبت گشت ز ماه پیدبرست  
بانع طاق سید راجوی بن جلال • کافاق از جمال کمالش منورست  
کاتب حروف عالم مسکین قایل است • امیدوار مغفرت از حضرت اکبرست

1. This wonderful edifice, which is higher than the heaven, and this unparalleled portico, which is full of ornaments,

2. Was built in the auspicious reign of Husain Sháh, whose glory in the present age is victorious.

3. It was planned by Sháh Harí Khán, son of Fath Khán, to whom, by the grace of God, the whole world is subject.

4. May his life be devoted for thousand years to the prosperity of the kingdom; for this kingdom rests for ever on the strength of his character.

5. It was in the year 881 A. H., that the date of the building was written.

6. The builder of this portico is Sayyid Rájú, son of Jalál, whose perfections illuminate the earth.

7. The writer of this inscription is a poor learned man and poet, and hopes in the mercy of the Supreme King.

In the third line, the metre shews that Sháh Harí Khán is the son of Fath Khán. The word *hiqad* in the 7th line, is a most extraordinary form for *hashqad*, the well known abbreviation of *hashtqad*. In the Journal for 1872, Part I, p. 113, I condemned this form as absurd; but General Cunningham drew my attention to this inscription from Kanauj and two others from Málwah, in which *hiqad* also occurs. There is, therefore, no doubt as to its existence, although we have to remember that no dictionary gives it, and that it only occurs in inscriptions written by wretched poets.

How wretched the above inscription is in point of versification, may be seen from the last line, where *kátib-kurúf*, and worse still *hazrat akbar*, are used 'ob metrum' without *Izáfat*.



"The inscription inside over the entrance of the vault," says Mr. Beale, "informs us that the building was once seriously damaged by an earthquake, and that it was repaired, in 1209 A. H. [A. D. 1794], by one 'Abbás 'Alí, a descendant of the builder."

There is another mausoleum in Kanauj on the banks of the Kálí Nai, with a high dome. The building is surrounded by high walls. An inscription over the gate informs us that it is the resting place of one Shaikh Nágah, who died in A. H. 1009 [A. D. 1600], and that the builder and writer of the inscription is Rukn-uddín, son of 'Alá-uddín 'Usmání.

But a Mausoleum of greater renown is the Rauzah of Shaikh Kabír Bálá Pír, which is likewise situated on the banks of the Kálí Nai. Bálá Pír was the son of Shaikh Qásim Qádirí, who lies buried in Chandálgarh. Bálá Pír died during the reign of Sháhjahán on the 10th Ramazán, 1054. For the inscriptions, *vide* Miftáh uttawárikh, p. 250.

The following papers were read :—

1. *Enumeration of Burmese Palms.* By S. KURZ, Esq.

[Received October 9th].

(Abstract).

The paper contains an enumeration of 42 species of Burmese palms besides 6 doubtful or imperfectly described species of rattans. Amongst the 42 species 8 are new, and some of them are of intense interest, like *Calamus tegrinus* and *C. Andamanicus*. A gigantic stemless *Corypha* (*C. macropoda*) indigenous to the Andamans, produces fan-shaped leaves upwards of 30 feet in length. All the new species are illustrated, and figures given also of other incompletely known palms on the 25 plates which accompany the paper.

This paper will be published in the Journal, Part II, 1874.

2. *Note on two Muhammadan Gold Coins.* By the HON. E. C. BAYLEY, C. S. I.

This note will appear in the Journal, Part I, No. IV.

3. *On the Ruins of Dimapur, on the Dunsiri River, Asám.* By MAJOR H. H. GODWIN-AUSTEN, F. R. G. S., F. Z. S. Deputy Superintendent, Topographical Survey of India.

This paper will be published in the Journal, Part I, 1874.

4. *The Bhádu and the Báuris.*—By UPENDRA CHANDRA MUKERJEE, Bánkurah.

The festival most remarkable in the district of Bánkurah, and in that part of the non-regulation province of Chutiá Nágpur which goes under the name Mánbhúin (and better known as Parúlia), is the Bhádu, which takes that name on account of its celebration in the month of Bhádra.

The Bhádu originated with the Báuris, the aborigines of Bānkurah and Purúlia. It is celebrated on the two last days of the month of Bhádra, and is personified in an idol of a small size representing a young girl, seated on a lotus or sometimes on a small square table: like all Hindú idols, the Bhádu wears a coronet on the head, and is decorated with garlands. The month of Bhádra is an interesting season for the people of Bānkurah. In the beginning of the month, the idol is ushered into the house of every well-to-do Báuri woman with shouting and singing; and every evening (till the end of the month) there is a gathering of women and girls round the Bhádu, who pay homage in songs to their adored deity. It is interesting to note that the Bhádu is not actually worshipped with *mantras*, as it has not got the sanction of the Hindú religion, but is adored with songs. The Báuris are probably the descendants of the adjoining hill tribes, and are an able-bodied and strong race who follow the hard and laborious profession of the *palki* bearer. In complexion they are dark, but in their structure they are symmetrical and well proportioned. Their food consists generally of rice of the coarsest kind, dāl, and meat of all sorts, especially pork. The women are of a robust make. Country spirit is their chief drink, and the great peculiarity is, that women and men generally join when drinking and singing. At marriage feasts women sing round the bride and bridegroom, and men play the "mādal." Their music is not harmonious, the sound of the "mādal" resembles that of an English drum. But to return to the Bhádu. The last two days of the month of Bhádra are passed in continually beating the tom-tom: at night people get no sleep; and the whole town seems to be as it were in a state of complete excitement: on the Sanskrānti, or the last day of the month, the drawing of the idol in the famous tank of Dúberband takes place.

*History of the Bhádu.*—The Bhádu saw the light only twenty-five years ago in some village within the Pachet Rāj in the district of Mān-bhūm. It is said that one of the Rājahs of Pachet had a little daughter, who was the very personification of humanity and beauty. She was noted for her extreme kindness towards the Báuris and other lower orders of the people whose extreme poverty had excited her compassion. This little girl died very early in the month of Bhádra, and on her death the people round Kāshípúr commenced to worship her. According to others, Bhádú had its origin in the royal house of Pachet, where the Rānī in memory of her daughter Bhádrabatti had a small idol prepared and adored in the month of Bhádra when her daughter died.

Whatever may have been the origin of the Bhádu, it has a hold on the lower orders of the people, who in the absence of other idols to worship, adore the Bhádu with songs.

It is difficult to trace the derivation of the word Báuri, as it is difficult

to derive the names of races like the Bhils, the Kols, the Dhángars. They are divided into the following classes:—

1. Sikhoria. 2. Molo. 3. Dholo. 4. Pano.

The Sikhoria appear to have come from Sikhorbhúm (in the district of Purúlia), the Molos from Malabhúm (in the district of Bánkurali, formerly known as the land of wrestlers), the Dholo from Dholbhúm (in the district of Purúlia), and the Pano from Púri.

The marriage ceremony is thus celebrated: the bride and bridegroom are placed under an artificial tree, which is specially prepared for the occasion, when a twig of the Malhwá tree and a pot of water from a Brahman's house are brought, and the head Báurí of the bridegroom's family then takes the twig and dips the same into the pot of water and sprinkles the water on the heads of the bride and bridegroom; the ceremony is concluded by handing round spirits and meat. The barking of a dog at the time of the wedding is looked upon as a good omen, and some of the people present generally manage to bring in a dog, which is then beaten till the auspicious bark is heard.

The following is a specimen of the songs sung by the Báurís in worshipping Bhádu:—

(১) রাজকুমারী ভাদু আমার দুঃখের মর্ম জানে না।

সুকালো দুদেরি গলা আ মরি কাঁচা সোণা ॥

1. Our princess Bhádu is quite a stranger to any want! Ah! our chaste gold Bhádu, thy (infant) milk-drinking throat is dried for want of drink.

(২) হেদে যাব, পোন্দার আনবো, গড়িয়া দিব সিংহাসন।

তার ভিতরে খেলা করে রাজকুমারী ভাদু খন ॥

2. We will go to the goldsmiths and have a throne prepared, upon which our darling princess Bhádu shall play.

(৩) ভাদু আমার গরবিনী, হায় গো সোণার নখ খানি।

গারে দিব মল মল চাদর বুকে দিব জামদানী ॥

3. My Bhádu, delicate and gay, O how beautiful is thy gold nose ring; we shall wrap thy body with kerchief, and thy breast with muslin.

(৪) বেলা গেলো, সন্ধ্যা হোলো মাথা বান্ধ না জননী।

আর কেন্দো না ও গো ভাদু আর পাঠাব না আজি ॥

4. The day is over, the evening has come, adjust your hair, my child; do not weep, O Bhádu. No more shall I send thee to thy father-in-law's.

(৫) কার বাড়ীতে ছিলে ভাদু কে করেছে পূজা গো।

বুকে মায়ের রক্তচন্দন পায়ে লাল জবা গো ॥

5. At whose house hast thou been, O Bhádu? who hath worshipped thee? thou hast red sandal powder upon thy breast and red jabá (a red Indian flower) on thy feet.

(৩) ভাদু আমার মান করেছে মানে গেল সারা রাত।

মানের কপাট ভাঙ্গ ভাদু পায়ে পড়ে প্রাণনাথ ॥

6. Bhádu is in her offended mood, in which she has passed the night ; break thy angry mood, O Bhádu, thy dear lover is at thy feet.

(৭) এনেছি বনেরি ফুল সুগন্ধ মালতী গো।

ভাদুর গলে হার গাঁথিব পালঙ্কে বসাইয়া গো ॥

7. I have brought odorous flowers from forests, the Malathi (Jasmin) to make a garland for Bhádu seated on her couch.

(৮) অগুরু চন্দন ঘষে দিব ভাদুর বদনে।

বাঁকা করে বেঁক বেণী কাজল দিব নয়নে ॥

8. We shall smear thy temples with scented sandal essence, adjust thy tuft of hair turned a little askance, and blacken the edges of thy eyes.

(৯) ভাদু আমার গরবিণী, ভাদু আমার প্রাণের ধন।

না দেখতে পেলে ঘনে ঘনে অচেতন ॥

9. Bhádu, my delicate girl—my life's treasure! I lose my sense every minute I lose sight of thee.

The reading of the following paper was postponed—

On a secondary sexual character in *Squilla raphidea*, Fabr. By J. Wood-Mason.

#### LIBRARY.

The following additions have been made to the Library since the meeting held in November last.

#### Presentations.

\*\*\* Names of Donors in Capitals.

Journal of the Royal Geological Society of Ireland, Vol. III, Part 3, 1872-73.

*A. Macalister*.—A Description of two Vedda Skulls from Ceylon. *Meadows Taylor*.—The Coal-Fields of Central India, from the Reports of the Geological Survey of India and other Official Sources.

#### THE ROYAL GEOLOGICAL SOCIETY OF IRELAND.

Bulletin de la Société de Géographie, Juillet, Août, 1873.

Juillet. *Joseph Halévy*.—Voyage au Nedgran.

Août. *Elisée Reclus*.—Note relative à l'histoire de la mer d'Aral. Triangulation de l'Inde Anglaise.

#### LA SOCIÉTÉ DE GÉOGRAPHIE, PARIS.

Congrès International des Orientalistes, 1re Session, 1873.

#### THE CONGRESS.

Monatsbericht der Königlich Preussischen Akademie der Wissenschaften zu Berlin, Mai, 1873.

*Peters*.—Über zwei Giftschlangen aus Afrika, und über neue oder weniger bekannte Gattungen und Arten von Batrachiern.

KÖNIGLICH PREUSSISCHE AKADEMIE DER WISSENSCHAFTEN ZU BERLIN.

Schriften der Königlichen Physikalisch-Oekonomischen Gesellschaft zu Königsberg. Jahr XII, Abth. 2.

KÖNIGLICHE PHYSIKALISCH-OEKONOMISCHE GESELLSCHAFT ZU KÖNIGSBERG.

Proceedings of the American Philosophical Society, Vol. XII, No. 89.

THE AMERICAN PHILOSOPHICAL SOCIETY, PHILADELPHIA.

Memoirs of the Boston Society of Natural History, Vol. II.

Part I, No. III.

*Elliott Conks.*—On the Osteology and Myology of *Didelphys Virginiana*.

Part II, No. I.

*A. S. Packard.*—On the Development of *Limulus Polyphemus*.

Part II, No. II.

*E. S. Morse.*—On the early stages of *Terebratulina septentrionalis*.

THE BOSTON SOCIETY OF NATURAL HISTORY.

Memoir of Sir Benjamin Thompson, Count Rumford, by G. E. Ellis.

The complete Works of Count Rumford, Vol. I.

THE AMERICAN ACADEMY OF ARTS AND SCIENCES, BOSTON.

A Phrenologist amongst the Todas, by Lt. Col. W. E. Marshall, B. S. C.

THE AUTHOR.

The Prosody of the Persians, by H. Blochmann, M. A.

THE AUTHOR.

Substances used for Food, Drink and Smoking, by the Natives of Bengal, by Pratápachandra Ghosha.

THE AUTHOR.

Notes on the Avifauna of the Aleutian Islands. Supplement to the "Revision of the *Terebratulidæ*," with additions, corrections and revisions of the *Craniidæ* and *Discinidæ*. Notes on the Genus *Anisothyrus*, Conrad, with a description of a new species, by W. H. Dall.

THE AUTHOR.

Et lidet Fund af Mynter, fra 11te Aarhundrede. Om Vægten af nogle Smykker fra Oldtiden af sødelt Metal, samt om de paa saadanne anbragte Betegnelser af Vægten, by C. A. Holmboe.

THE AUTHOR.

Professional Papers on Indian Engineering, October, 1873.

Addis' Single-Rail Tramway. *W. H. Price.*—Portland Cement at Kurrachee. *Capt. J. L. L. Morant.*—The Breck's Memorial School at Ootacamund, Nilagiri. *Major H. Tulloch.*—The Water-supply of Bombay. *E. A. Sibold.*—Distribution of Canal Water.

THE EDITOR.

The Calcutta Journal of Medicine, No. 9, 1873.

THE EDITOR.

The Christian Spectator, Nos. 28, 29 and 30.

THE EDITOR.

The Grammar of the Thibetan Language, by A. Csoma de Kúros.  
Principal Heads of the History and Statistics of the Dacca District.

MAJOR H. H. GODWIN-AUSTEN.

Catalogue of Sanscrit MSS. existing in Oudh, fasc. III.

THE DIRECTOR OF PUBLIC INSTRUCTION, OUDH.

The Indian Antiquary, October and November, 1873.

October, *M. J. Walkhouse*.—On some formerly existing antiquities of the Nilgiris.  
*A. K. Nairne*.—Musliman remains in the South Konkan. Traces in the Bhagavatgitá of Christian Writings and Ideas. *J. F. Fleet*.—Notes on Inscriptions of Gaddak in the Dambal Taluka of the Dharwad District.

November, *Rev. F. Kittel*.—On the Karnátaka Vaishnava Dásas. Major *J. W. Watson*.—Legends of the earlier Chudásamā Rás of Júnágadh. *A. K. Nairne*.—Musliman remains in the South Konkan. *L. Rice*.—Jaina Inscriptions from Srávana Belgola. *Rev. F. J. Leeper*.—The Naladiyar. *E. Rehalsek*.—Deri phrases and Dialogues. *Capt. E. W. West*.—Kari Dastur in Jesht Purnima.

THE GOVERNMENT OF INDIA, HOME DEPARTMENT.

Record of the March of the Mission to Seistan, by Surgeon H. W. Bellew.

THE GOVERNMENT OF INDIA, FOREIGN DEPARTMENT.

Records of the Geological Survey of India, Vol. VI, Part 4.

*G. W. H. Hughes*.—Note on some of the Iron Deposits of Chándá, Central Provinces.  
*V. Ball*.—Barren Island and Narkoundam. *W. Theobald*.—Stray Notes on the Metalliferous resources of British Burma.

THE GOVERNMENT OF INDIA, REVENUE DEPARTMENT.

Report on the Administration of the Income Tax in the Lower Provinces for 1872-73.

Report on the Administration of the Salt Department for 1872-73.

Report on the Administration of the Registration Department in Bengal for 1872-73, by R. H. Wilson.

Report on the Revenue Survey operations of the Lower Provinces for 1871-72.

Papers regarding the Tea Industry in Bengal.

THE GOVERNMENT OF BENGAL.

*Exchange.*

Nature, Nos. 205—208.

*Purchase.*

Pratna-kamra-Nandini, Nos. 2-6.

The Calcutta Review, October, 1873.

Rennell's Memoir of the Map of Hindustan.

Bruce's Annals of British India, 3 vols.



# Meteorological Observations.

i

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of January 1873.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at 32° Fahr. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|-------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                 | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                         | Inches.                                   | Inches. | Inches. | °                             | °                                             | °    | °     |
| 1     | 29.923                                          | 30.000                                    | 29.860  | 0.140   | 65.8                          | 75.2                                          | 58.5 | 16.7  |
| 2     | .922                                            | 29.992                                    | .878    | .114    | 66.5                          | 77.5                                          | 58.0 | 19.5  |
| 3     | .876                                            | .934                                      | .800    | .125    | 66.6                          | 78.0                                          | 57.5 | 20.5  |
| 4     | .911                                            | .978                                      | .867    | .111    | 67.3                          | 79.0                                          | 58.2 | 20.8  |
| 5     | .907                                            | .991                                      | .835    | .156    | 69.1                          | 79.8                                          | 59.4 | 20.4  |
| 6     | .853                                            | .917                                      | .801    | .116    | 71.5                          | 83.6                                          | 61.5 | 22.1  |
| 7     | .818                                            | .903                                      | .805    | .098    | 73.4                          | 84.0                                          | 66.5 | 17.5  |
| 8     | .932                                            | 30.005                                    | .857    | .148    | 72.6                          | 81.0                                          | 68.5 | 12.5  |
| 9     | .988                                            | .071                                      | .941    | .130    | 63.3                          | 71.4                                          | 57.5 | 13.9  |
| 10    | .952                                            | .037                                      | .886    | .151    | 62.2                          | 71.5                                          | 54.8 | 16.7  |
| 11    | .080                                            | .053                                      | .922    | .131    | 61.5                          | 69.5                                          | 54.7 | 14.8  |
| 12    | .996                                            | .069                                      | .934    | .135    | 61.2                          | 71.5                                          | 53.0 | 18.5  |
| 13    | .994                                            | .068                                      | .924    | .144    | 62.1                          | 72.5                                          | 53.5 | 19.0  |
| 14    | .976                                            | .060                                      | .920    | .140    | 65.7                          | 78.5                                          | 55.0 | 23.5  |
| 15    | .923                                            | 29.983                                    | .865    | .118    | 69.5                          | 80.3                                          | 62.8 | 17.5  |
| 16    | .930                                            | 30.012                                    | .857    | .155    | 68.4                          | 78.0                                          | 59.5 | 18.5  |
| 17    | .902                                            | 29.981                                    | .848    | .133    | 68.4                          | 78.7                                          | 60.0 | 18.7  |
| 18    | .964                                            | 30.030                                    | .905    | .134    | 69.8                          | 80.0                                          | 62.0 | 18.0  |
| 19    | .990                                            | .064                                      | .942    | .122    | 71.5                          | 78.0                                          | 67.7 | 10.3  |
| 20    | 30.030                                          | .091                                      | .975    | .116    | 69.9                          | 77.5                                          | 64.0 | 13.5  |
| 21    | .070                                            | .160                                      | 30.018  | .142    | 70.0                          | 79.0                                          | 62.5 | 16.5  |
| 22    | .075                                            | .155                                      | .010    | .145    | 69.8                          | 77.5                                          | 62.7 | 14.8  |
| 23    | .066                                            | .156                                      | .002    | .154    | 69.8                          | 78.5                                          | 62.7 | 15.8  |
| 24    | .033                                            | .123                                      | 29.960  | .163    | 70.1                          | 78.5                                          | 63.2 | 15.3  |
| 25    | 29.950                                          | .029                                      | .884    | .145    | 70.7                          | 80.6                                          | 61.0 | 18.7  |
| 26    | .913                                            | 29.998                                    | .868    | .130    | 71.2                          | 80.5                                          | 65.4 | 15.1  |
| 27    | .933                                            | 30.019                                    | .868    | .151    | 68.7                          | 78.6                                          | 60.6 | 18.0  |
| 28    | .963                                            | .016                                      | .907    | .139    | 66.1                          | 77.3                                          | 55.8 | 21.5  |
| 29    | .987                                            | .060                                      | .937    | .123    | 67.5                          | 79.0                                          | 58.7 | 20.3  |
| 30    | 30.002                                          | .081                                      | .940    | .141    | 67.9                          | 79.0                                          | 58.0 | 21.0  |
| 31    | .017                                            | .101                                      | .971    | .130    | 70.2                          | 82.0                                          | 60.0 | 22.0  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of January. 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 60.7                            | 5.1                 | 56.6                | 9.2                          | .467                             | 5.18                                             | 1.86                                                                | 0.74                                                                |
| 2     | 60.9                            | 5.6                 | 56.4                | 10.1                         | .464                             | .14                                              | 2.05                                                                | .72                                                                 |
| 3     | 60.9                            | 5.7                 | 56.3                | 10.3                         | .462                             | .13                                              | .08                                                                 | .71                                                                 |
| 4     | 59.9                            | 7.4                 | 51.0                | 13.3                         | .428                             | 4.73                                             | .64                                                                 | .64                                                                 |
| 5     | 62.6                            | 6.5                 | 57.4                | 11.7                         | .480                             | 5.28                                             | .50                                                                 | .68                                                                 |
| 6     | 66.1                            | 5.4                 | 61.8                | 9.7                          | .555                             | 6.09                                             | .29                                                                 | .73                                                                 |
| 7     | 68.5                            | 4.9                 | 64.6                | 8.8                          | .609                             | .66                                              | .21                                                                 | .75                                                                 |
| 8     | 68.8                            | 3.8                 | 65.8                | 6.8                          | .634                             | .94                                              | 1.72                                                                | .80                                                                 |
| 9     | 55.4                            | 7.0                 | 48.3                | 15.0                         | .352                             | 3.93                                             | 2.58                                                                | .60                                                                 |
| 10    | 54.8                            | 7.4                 | 49.1                | 14.1                         | .350                             | .91                                              | .38                                                                 | .62                                                                 |
| 11    | 53.8                            | 7.7                 | 46.9                | 14.6                         | .336                             | .75                                              | .41                                                                 | .61                                                                 |
| 12    | 54.7                            | 6.5                 | 48.8                | 12.4                         | .358                             | 4.01                                             | .09                                                                 | .66                                                                 |
| 13    | 56.1                            | 6.0                 | 50.7                | 11.4                         | .382                             | .28                                              | 1.99                                                                | .68                                                                 |
| 14    | 59.8                            | 5.9                 | 55.1                | 10.6                         | .414                             | .93                                              | 2.09                                                                | .70                                                                 |
| 15    | 63.6                            | 5.9                 | 58.9                | 10.6                         | .504                             | 5.55                                             | .33                                                                 | .70                                                                 |
| 16    | 61.9                            | 6.5                 | 56.7                | 11.7                         | .469                             | .16                                              | .46                                                                 | .68                                                                 |
| 17    | 61.7                            | 6.7                 | 56.3                | 12.1                         | .462                             | .10                                              | .52                                                                 | .67                                                                 |
| 18    | 66.5                            | 3.3                 | 63.9                | 5.9                          | .595                             | 6.55                                             | 1.40                                                                | .82                                                                 |
| 19    | 67.8                            | 3.7                 | 64.8                | 6.7                          | .613                             | .79                                              | .65                                                                 | .80                                                                 |
| 20    | 65.0                            | 4.9                 | 61.1                | 8.8                          | .543                             | 5.97                                             | 2.01                                                                | .75                                                                 |
| 21    | 64.6                            | 5.4                 | 60.3                | 9.7                          | .528                             | .81                                              | .19                                                                 | .73                                                                 |
| 22    | 64.3                            | 5.5                 | 59.9                | 9.9                          | .521                             | .73                                              | .22                                                                 | .72                                                                 |
| 23    | 64.5                            | 5.3                 | 60.3                | 9.5                          | .528                             | .81                                              | .14                                                                 | .73                                                                 |
| 24    | 64.4                            | 5.7                 | 59.8                | 10.3                         | .520                             | .71                                              | .32                                                                 | .71                                                                 |
| 25    | 65.0                            | 5.7                 | 60.4                | 10.3                         | .530                             | .83                                              | .35                                                                 | .71                                                                 |
| 26    | 65.5                            | 5.7                 | 60.9                | 10.3                         | .539                             | .92                                              | .38                                                                 | .71                                                                 |
| 27    | 59.9                            | 8.8                 | 52.9                | 15.8                         | .412                             | 4.55                                             | 3.14                                                                | .59                                                                 |
| 28    | 57.4                            | 8.7                 | 50.4                | 15.7                         | .379                             | .20                                              | 2.90                                                                | .59                                                                 |
| 29    | 59.1                            | 8.4                 | 52.4                | 15.1                         | .405                             | .48                                              | .94                                                                 | .60                                                                 |
| 30    | 60.2                            | 7.7                 | 54.0                | 13.9                         | .428                             | .72                                              | .79                                                                 | .63                                                                 |
| 31    | 63.1                            | 7.1                 | 57.4                | 12.8                         | .480                             | 5.27                                             | .78                                                                 | .66                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of January 1878.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Falt. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 29.967                                          | 30.086                                                       | 29.853  | 0.233   | 61.2                          | 70.8                                                             | 57.0 | 13.8  |
| 1              | .956                                            | .977                                                         | .836    | .241    | 63.5                          | 70.5                                                             | 56.0 | 14.5  |
| 2              | .916                                            | .970                                                         | .826    | .244    | 62.8                          | 70.0                                                             | 55.5 | 14.5  |
| 3              | .936                                            | .956                                                         | .817    | .239    | 62.1                          | 69.6                                                             | 54.5 | 15.1  |
| 4              | .932                                            | .919                                                         | .811    | .238    | 61.5                          | 69.2                                                             | 54.0 | 15.2  |
| 5              | .912                                            | .962                                                         | .815    | .247    | 61.1                          | 69.0                                                             | 53.0 | 16.0  |
| 6              | .955                                            | .974                                                         | .836    | .238    | 60.5                          | 68.7                                                             | 53.0 | 15.7  |
| 7              | .975                                            | .994                                                         | .858    | .236    | 60.2                          | 68.5                                                             | 53.0 | 15.5  |
| 8              | 30.001                                          | .124                                                         | .871    | .253    | 62.0                          | 69.7                                                             | 55.0 | 14.7  |
| 9              | .027                                            | .150                                                         | .885    | .265    | 65.6                          | 70.5                                                             | 59.5 | 11.0  |
| 10             | .037                                            | .160                                                         | .903    | .257    | 69.5                          | 73.5                                                             | 62.7 | 10.8  |
| 11             | .024                                            | .153                                                         | .890    | .263    | 72.3                          | 77.4                                                             | 65.0 | 12.4  |
| Noon.          | 29.995                                          | .125                                                         | .868    | .257    | 74.6                          | 80.6                                                             | 67.0 | 13.6  |
| 1              | .962                                            | .982                                                         | .810    | .212    | 76.2                          | 82.4                                                             | 68.6 | 13.8  |
| 2              | .933                                            | .950                                                         | .815    | .235    | 77.3                          | 83.7                                                             | 69.0 | 14.7  |
| 3              | .914                                            | .937                                                         | .808    | .229    | 77.8                          | 84.0                                                             | 69.5 | 14.5  |
| 4              | .907                                            | .929                                                         | .805    | .221    | 76.6                          | 82.5                                                             | 68.0 | 14.5  |
| 5              | .912                                            | .930                                                         | .801    | .229    | 75.2                          | 81.0                                                             | 66.8 | 14.2  |
| 6              | .923                                            | .941                                                         | .826    | .215    | 72.0                          | 77.6                                                             | 64.5 | 13.1  |
| 7              | .940                                            | .962                                                         | .841    | .221    | 70.1                          | 75.5                                                             | 62.5 | 13.0  |
| 8              | .960                                            | .972                                                         | .861    | .211    | 68.5                          | 73.5                                                             | 61.2 | 12.3  |
| 9              | .974                                            | .983                                                         | .874    | .209    | 67.1                          | 72.4                                                             | 59.5 | 12.9  |
| 10             | .982                                            | .998                                                         | .882    | .216    | 65.0                          | 71.5                                                             | 58.5 | 13.0  |
| 11             | .978                                            | .992                                                         | .875    | .217    | 65.2                          | 71.0                                                             | 58.0 | 13.0  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb  
Thermometer Means are derived from the observations made at the several  
hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of January 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 60.8                            | 3.4                 | 57.7                | 6.5                          | 0.485                            | 5.38                                             | 1.31                                                                | 0.80                                                                |
| 1              | 60.3                            | 3.2                 | 57.4                | 6.1                          | .480                             | .35                                              | .20                                                                 | .82                                                                 |
| 2              | 59.8                            | 3.0                 | 57.1                | 6.7                          | .475                             | .30                                              | .11                                                                 | .83                                                                 |
| 3              | 59.3                            | 2.8                 | 56.8                | 5.3                          | .470                             | .26                                              | .01                                                                 | .84                                                                 |
| 4              | 58.8                            | 2.7                 | 56.4                | 5.1                          | .464                             | .19                                              | 0.97                                                                | .84                                                                 |
| 5              | 58.4                            | 2.7                 | 56.0                | 5.1                          | .458                             | .13                                              | .95                                                                 | .84                                                                 |
| 6              | 58.0                            | 2.5                 | 55.7                | 4.8                          | .453                             | .08                                              | .89                                                                 | .85                                                                 |
| 7              | 57.7                            | 2.5                 | 55.4                | 4.8                          | .449                             | .03                                              | .88                                                                 | .85                                                                 |
| 8              | 58.9                            | 3.1                 | 55.1                | 5.9                          | .459                             | .14                                              | 1.11                                                                | .82                                                                 |
| 9              | 60.6                            | 5.0                 | 56.6                | 9.0                          | .467                             | .18                                              | .82                                                                 | .74                                                                 |
| 10             | 62.5                            | 7.0                 | 58.9                | 12.6                         | .472                             | .18                                              | 2.70                                                                | .66                                                                 |
| 11             | 63.2                            | 9.1                 | 55.9                | 16.4                         | .456                             | 4.09                                             | 3.59                                                                | .58                                                                 |
| Noon.          | 63.9                            | 10.7                | 56.4                | 18.2                         | .464                             | 5.05                                             | 4.15                                                                | .55                                                                 |
| 1              | 64.4                            | 11.8                | 56.1                | 20.1                         | .459                             | 4.99                                             | .67                                                                 | .52                                                                 |
| 2              | 64.9                            | 12.4                | 56.2                | 21.1                         | .461                             | .99                                              | .99                                                                 | .50                                                                 |
| 3              | 65.0                            | 12.8                | 56.0                | 21.8                         | .458                             | .95                                              | 5.18                                                                | .49                                                                 |
| 4              | 64.4                            | 12.2                | 55.9                | 20.7                         | .456                             | .94                                              | 4.83                                                                | .51                                                                 |
| 5              | 64.7                            | 10.5                | 57.3                | 17.9                         | .478                             | 5.20                                             | .17                                                                 | .56                                                                 |
| 6              | 65.0                            | 7.0                 | 59.4                | 12.6                         | .513                             | .61                                              | 2.59                                                                | .66                                                                 |
| 7              | 64.2                            | 5.9                 | 59.5                | 10.6                         | .515                             | .65                                              | .99                                                                 | .70                                                                 |
| 8              | 63.5                            | 5.0                 | 59.5                | 9.0                          | .515                             | .68                                              | 1.97                                                                | .74                                                                 |
| 9              | 62.6                            | 4.5                 | 59.0                | 8.1                          | .506                             | .60                                              | .72                                                                 | .77                                                                 |
| 10             | 62.1                            | 3.9                 | 59.0                | 7.0                          | .506                             | .61                                              | .47                                                                 | .79                                                                 |
| 11             | 61.5                            | 3.7                 | 58.5                | 6.7                          | .498                             | .52                                              | .39                                                                 | .80                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of January 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |                |                 | General aspect of the Sky.                                                                   |
|-------|-----------------------|---------------------------------|-----------------------|----------------|-----------------|----------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure. | Daily Velocity. |                                                                                              |
|       | <sup>o</sup>          | Inches                          |                       | lb             | Miles           |                                                                                              |
| 1     | 130.0                 | ...                             | N N E & W N W         | ...            | 74.8            | B. Slightly foggy at midnight & 1 A. M., & from 7 to 10 P. M.                                |
| 2     | 122.6                 | ...                             | W N W & N W           | ...            | 50.5            | B. Slightly foggy from 5 to 9 A. M., & 7 to 10 P. M.                                         |
| 3     | 127.5                 | ...                             | S S E & N W           | ...            | 49.7            | B. Slightly foggy at 6 & 7 A. M. & from 7 to 10 P. M.                                        |
| 4     | 124.9                 | ...                             | N W & W N W           | ...            | 98.8            | B. Slightly foggy from 7 to 9 P. M.                                                          |
| 5     | 130.0                 | ...                             | W by S & W N W        | ...            | 79.9            | B to 2 P. M., & 1 to 5 P. M. B to 11 P. M. Slightly foggy from 4 to 7 A. M., & 7 to 10 P. M. |
| 6     | 135.2                 | ...                             | W by S & S S W        | ...            | 65.4            | B. Slightly foggy at 6 A. M., 7 to 8 P. M.                                                   |
| 7     | 139.0                 | ...                             | S S W & W N W         | ...            | 43.0            | B. Slightly foggy from 6 to 8 A. M.                                                          |
| 8     | 127.0                 | ...                             | S by W & N N W        | ...            | 71.3            | B to 8 A. M. S to 12 A. M. B to 11 P. M., Slightly foggy from 3 to 6 A. M.                   |
| 9     | 129.0                 | ...                             | N & N W               | ...            | 193.5           | B. Slightly foggy at 7 & 8 P. M.                                                             |
| 10    | 128.0                 | ...                             | S E, ENE & N W        | ...            | 61.9            | B. Slightly foggy from 7 to 11 P. M.                                                         |
| 11    | 124.7                 | ...                             | N N E & N N W         | ...            | 94.4            | B. Slightly foggy from midnight to 3 A. M.                                                   |
| 12    | 122.0                 | ...                             | N E & N W             | ...            | 45.0            | B. Slightly foggy from 7 to 11 P. M.                                                         |
| 13    | 122.2                 | ...                             | N N E & W by N        | ...            | 33.0            | B. Slightly foggy from midnight to 3 at 6, 7 & 11 A. M., & from 7 to 9 P. M.                 |
| 14    | 131.2                 | ...                             | [Variable W by N, W & | ...            | 30.0            | B. Slightly foggy from 5 to 8 A. M.                                                          |
| 15    | 133.0                 | ...                             | S S W & W             | ...            | 143.8           | B. Slightly foggy at 7 & 8 P. M.                                                             |
| 16    | 128.5                 | ...                             | N E & ENE             | ...            | 74.8            | B. Slightly foggy at 10 & 11 P. M.                                                           |
| 17    | 120.6                 | ...                             | ENE & W by N          | ...            | 68.6            | B. Slightly foggy at midnight & 1 A. M.                                                      |
| 18    | 124.0                 | ...                             | S & W by S            | ...            | 36.2            | B to 4 A. M. S to 11 A. M., & 1 to 4 P. M. B to 11 P. M., Foggy from 4 to 9 A. M.            |

∩ i Cirri, — i Strati, ∩ i Cumuli, ∩ i Cirro-strati, ~ i Cumulo-strati, ∩ i Nimbi, ∩ i Cirro-cumuli, B clear, S strati, O overcast, T thunder, L lightning, R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of January 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge<br>1½ ft. above<br>Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                               |
|-------|-----------------------|---------------------------------------|-----------------------|---------------|-----------------|----------------------------------------------------------------------------------------------------------|
|       |                       |                                       | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                          |
|       | <sup>0</sup>          | Inches.                               |                       | lb            | Miles           |                                                                                                          |
| 19    | 123.4                 | ...                                   | N N E & N E           | ...           | 51.3            | B to 5 A. M. S to 11 A. M., $\searrow$ i to 5 P. M. B to 11 P. M., Foggy from 3 to 10 A. M.              |
| 20    | 124.8                 | ...                                   | N E & E N E           | ...           | 120.1           | $\searrow$ i to 2 A. M., $\searrow$ i to P. M. O to 7 P. M. B to 11 P. M.                                |
| 21    | 128.0                 | ...                                   | E N E                 | ...           | 94.8            | B to 1 P. M., $\searrow$ i to 6 P. M. B to 11 P. M.                                                      |
| 22    | 125.0                 | ...                                   | E N E & E             | ...           | 81.8            | B to 1 A. M., $\searrow$ i to 8 A. M. B to 11 A. M. $\searrow$ i & $\searrow$ i to 5 P. M. B to 11 P. M. |
| 23    | 130.0                 | ...                                   | S E & E by N          | ...           | 46.3            | Chiefly B. Slightly foggy from 4 to 7 A. M. at 8 & 9 P. M.                                               |
| 24    | 131.0                 | ...                                   | E by N & N W          | ...           | 31.8            | B. Slightly foggy from 5 to 7 A. M. & 8 to 10 P. M.                                                      |
| 25    | 133.5                 | ...                                   | N E & N N W           | ...           | 33.2            | B to 12 A. M., $\searrow$ i & $\searrow$ i to 6 P. M. B to 11 P. M. Slightly foggy at 8 P. M.            |
| 26    | 133.0                 | ...                                   | S E & N N W           | ...           | 41.7            | B to 4 A. M. O to 9 A. M. B to 11 P. M., Foggy from 1 to 9 A. M. & 9 to 11 P. M.                         |
| 27    | 133.8                 | ...                                   | N N E & N N W         | ...           | 78.1            | B.                                                                                                       |
| 28    | 130.2                 | ...                                   | N N E & N N W         | ...           | 101.4           | B.                                                                                                       |
| 29    | 131.2                 | ...                                   | N by W & N N W        | ...           | 108.3           | B.                                                                                                       |
| 30    | 128.0                 | ...                                   | N N W & N W           | ...           | 101.4           | B. Slightly foggy at 10 & 11 P. M.                                                                       |
| 31    | 133.0                 | ...                                   | N W & N E             | ...           | 33.2            | B. Slightly foggy at 8 & 9 P. M.                                                                         |

$\searrow$  i Cirri,—i Strati,  $\searrow$  i Cumuli,  $\searrow$  i Cirro-strati,  $\searrow$  i Cumulo-strati,  $\searrow$  i Nimbi,  
 $\searrow$  i Cirro-cumuli, B clear, S strati, O overcast, T thunder, L lightning  
R. rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of January 1873.*

MONTHLY RESULTS.

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|                                                                   | Inches. |
|-------------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..                 | 29.962  |
| Max. height of the Barometer occurred at 10 a. m. on the 21st ... | 30.160  |
| Min. height of the Barometer occurred at 5 p. m. on the 6th ...   | 29.801  |
| Extreme range of the Barometer during the month ...               | 0.359   |
| Mean of the daily Max. Pressures ... ..                           | 30.038  |
| Ditto ditto Min. ditto ... ..                                     | 29.903  |
| Mean daily range of the Barometer during the month ...            | 0.135   |

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|                                                             | °    |
|-------------------------------------------------------------|------|
| Mean Dry Bulb Thermometer for the month ... ..              | 68.0 |
| Max. Temperature occurred at 3 p. m. on the 7th ... ..      | 84.0 |
| Min. Temperature occurred at 5, 6 & 7 a. m. on the 12th ... | 53.0 |
| Extreme range of the Temperature during the month ...       | 31.0 |
| Mean of the daily Max. Temperature ... ..                   | 77.9 |
| Ditto ditto Min. ditto, ... ..                              | 60.1 |
| Mean daily range of the Temperature during the month ...    | 17.8 |

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|                                                             |      |
|-------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..              | 61.8 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer   | 6.2  |
| Computed Mean Dew-point for the month ... ..                | 56.8 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ... | 11.2 |

|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.470   |

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|                                                                        | Troy grain. |
|------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                             | 5.19        |
| Additional Weight of Vapour required for complete saturation ...       | 2.34        |
| Mean degree of humidity for the month, complete saturation being unity | 0.69        |

|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 128.8 |

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|                                                                                                      | Inches.          |
|------------------------------------------------------------------------------------------------------|------------------|
| Rained No. day,—Max. fall of rain during 24 hours ... ..                                             | Nil              |
| Total amount of rain during the month ... ..                                                         | Nil              |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month ... .. | Nil              |
| Prevailing direction of the Wind ... ..                                                              | N. W. & N. N. W. |

\* Height 70 feet 10 inches above ground.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of February 1873.*

Latitude  $22^{\circ} 33' 1''$  North. Longitude  $88^{\circ} 20' 34''$  East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at $32^{\circ}$ Fahr. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|----------------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                          | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                                  | Inches.                                   | Inches. | Inches. | o                             | o                                             | o    | o     |
| 1     | 29.994                                                   | 30.082                                    | 29.940  | 0.142   | 71.4                          | 82.4                                          | 61.5 | 20.9  |
| 2     | 30.036                                                   | .114                                      | .957    | .157    | 70.4                          | 78.7                                          | 64.5 | 14.2  |
| 3     | .106                                                     | .194                                      | 30.049  | .145    | 68.7                          | 78.5                                          | 60.0 | 18.5  |
| 4     | .042                                                     | .112                                      | 29.966  | .146    | 66.3                          | 74.6                                          | 59.5 | 15.1  |
| 5     | 29.972                                                   | .060                                      | .891    | .169    | 67.7                          | 79.4                                          | 57.9 | 21.5  |
| 6     | .975                                                     | .065                                      | .916    | .149    | 69.4                          | 80.8                                          | 59.0 | 21.8  |
| 7     | .982                                                     | .057                                      | .939    | .118    | 70.7                          | 82.0                                          | 60.4 | 21.6  |
| 8     | .993                                                     | .072                                      | .953    | .119    | 72.8                          | 84.0                                          | 63.0 | 21.0  |
| 9     | .948                                                     | .018                                      | .884    | .134    | 75.2                          | 86.5                                          | 65.2 | 21.3  |
| 10    | .972                                                     | .061                                      | .927    | .134    | 74.8                          | 84.3                                          | 67.5 | 16.8  |
| 11    | .960                                                     | .039                                      | .908    | .131    | 73.1                          | 84.3                                          | 63.0 | 21.3  |
| 12    | 30.005                                                   | .102                                      | .945    | .157    | 71.8                          | 83.0                                          | 62.6 | 20.4  |
| 13    | 29.998                                                   | .092                                      | .935    | .157    | 69.6                          | 81.5                                          | 59.5 | 22.0  |
| 14    | .982                                                     | .057                                      | .928    | .129    | 69.9                          | 82.2                                          | 58.5 | 23.7  |
| 15    | .976                                                     | .067                                      | .911    | .156    | 70.9                          | 83.2                                          | 59.8 | 23.4  |
| 16    | .935                                                     | .011                                      | .869    | .142    | 71.8                          | 84.4                                          | 60.5 | 23.9  |
| 17    | .945                                                     | .011                                      | .890    | .121    | 73.5                          | 86.5                                          | 63.0 | 23.5  |
| 18    | .995                                                     | .070                                      | .940    | .130    | 75.5                          | 86.7                                          | 66.0 | 20.7  |
| 19    | 30.022                                                   | .111                                      | .954    | .157    | 75.7                          | 87.7                                          | 65.5 | 22.2  |
| 20    | 29.956                                                   | .047                                      | .868    | .179    | 76.6                          | 89.0                                          | 66.5 | 22.5  |
| 21    | .853                                                     | 29.923                                    | .783    | .140    | 77.3                          | 88.0                                          | 68.0 | 20.0  |
| 22    | .860                                                     | .958                                      | .810    | .148    | 78.2                          | 88.3                                          | 69.5 | 18.8  |
| 23    | .805                                                     | .883                                      | .722    | .161    | 79.7                          | 90.6                                          | 73.3 | 17.3  |
| 24    | .745                                                     | .807                                      | .686    | .121    | 79.3                          | 91.3                                          | 69.0 | 22.3  |
| 25    | .767                                                     | .816                                      | .719    | .127    | 80.6                          | 92.5                                          | 72.0 | 20.5  |
| 26    | .772                                                     | .852                                      | .723    | .129    | 80.4                          | 92.4                                          | 71.7 | 20.7  |
| 27    | .761                                                     | .837                                      | .697    | .140    | 81.3                          | 93.5                                          | 73.0 | 20.5  |
| 28    | .808                                                     | .904                                      | .718    | .186    | 77.6                          | 86.7                                          | 69.0 | 17.7  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of February 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>moneter. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 63.9                            | 7.5                 | 57.9                | 13.5                         | 0.488                            | 5.34                                             | 3.01                                                                | 0.64                                                                |
| 2     | 62.4                            | 8.0                 | 56.0                | 14.4                         | .458                             | .03                                              | .07                                                                 | .62                                                                 |
| 3     | 60.3                            | 8.4                 | 53.6                | 15.1                         | .422                             | 4.66                                             | .03                                                                 | .61                                                                 |
| 4     | 59.8                            | 6.4                 | 51.7                | 11.5                         | .438                             | .85                                              | 2.27                                                                | .68                                                                 |
| 5     | 60.2                            | 7.5                 | 54.2                | 13.5                         | .431                             | .75                                              | .71                                                                 | .64                                                                 |
| 6     | 61.6                            | 7.8                 | 55.4                | 14.0                         | .449                             | .94                                              | .92                                                                 | .63                                                                 |
| 7     | 64.3                            | 6.4                 | 59.2                | 11.5                         | .509                             | 5.59                                             | .59                                                                 | .68                                                                 |
| 8     | 66.5                            | 6.3                 | 61.5                | 11.3                         | .550                             | 6.02                                             | .69                                                                 | .69                                                                 |
| 9     | 68.9                            | 6.3                 | 64.5                | 10.7                         | .607                             | .61                                              | .76                                                                 | .71                                                                 |
| 10    | 65.8                            | 9.0                 | 59.5                | 15.3                         | .515                             | 5.61                                             | 3.65                                                                | .61                                                                 |
| 11    | 63.4                            | 9.7                 | 55.6                | 17.5                         | .452                             | 4.94                                             | .85                                                                 | .56                                                                 |
| 12    | 61.0                            | 10.8                | 52.4                | 19.4                         | .405                             | .44                                              | 4.01                                                                | .53                                                                 |
| 13    | 59.9                            | 9.7                 | 52.1                | 17.5                         | .401                             | .42                                              | 3.48                                                                | .56                                                                 |
| 14    | 59.9                            | 10.0                | 51.9                | 18.0                         | .398                             | .39                                              | .59                                                                 | .55                                                                 |
| 15    | 60.9                            | 10.0                | 52.9                | 18.0                         | .412                             | .53                                              | .70                                                                 | .55                                                                 |
| 16    | 62.1                            | 9.7                 | 54.3                | 17.5                         | .432                             | .73                                              | .72                                                                 | .56                                                                 |
| 17    | 66.9                            | 6.6                 | 62.3                | 11.2                         | .565                             | 6.17                                             | 2.73                                                                | .69                                                                 |
| 18    | 67.6                            | 7.9                 | 62.1                | 13.4                         | .561                             | .11                                              | 3.35                                                                | .65                                                                 |
| 19    | 67.4                            | 8.3                 | 61.6                | 14.1                         | .552                             | .00                                              | .51                                                                 | .63                                                                 |
| 20    | 67.7                            | 8.9                 | 61.5                | 15.1                         | .550                             | 5.98                                             | .79                                                                 | .61                                                                 |
| 21    | 69.0                            | 8.3                 | 63.2                | 14.1                         | .562                             | 0.31                                             | .67                                                                 | .63                                                                 |
| 22    | 70.7                            | 7.5                 | 65.4                | 12.8                         | .626                             | .77                                              | .48                                                                 | .66                                                                 |
| 23    | 72.4                            | 7.3                 | 67.3                | 12.4                         | .666                             | 7.19                                             | .53                                                                 | .67                                                                 |
| 24    | 70.5                            | 8.8                 | 64.3                | 15.0                         | .603                             | 0.52                                             | 4.07                                                                | .62                                                                 |
| 25    | 74.6                            | 6.0                 | 70.4                | 10.2                         | .736                             | 7.94                                             | 3.07                                                                | .72                                                                 |
| 26    | 73.2                            | 7.2                 | 68.2                | 12.2                         | .686                             | .40                                              | .54                                                                 | .68                                                                 |
| 27    | 72.8                            | 8.5                 | 66.8                | 14.5                         | .655                             | .04                                              | 4.20                                                                | .63                                                                 |
| 28    | 64.9                            | 12.7                | 56.0                | 21.6                         | .453                             | 4.85                                             | 5.12                                                                | .49                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants. ;

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of February 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 29.935                                          | 30.107                                                       | 29.738  | 0.369   | 69.3                          | 77.5                                                             | 62.2 | 15.3  |
| 1              | .927                                            | .101                                                         | .729    | .372    | 68.6                          | 76.5                                                             | 61.5 | 15.0  |
| 2              | .918                                            | .090                                                         | .723    | .367    | 67.8                          | 75.6                                                             | 60.5 | 15.1  |
| 3              | .908                                            | .078                                                         | .718    | .360    | 67.2                          | 75.0                                                             | 60.0 | 15.0  |
| 4              | .907                                            | .074                                                         | .723    | .351    | 66.5                          | 74.7                                                             | 59.5 | 15.2  |
| 5              | .921                                            | .084                                                         | .730    | .354    | 65.8                          | 74.2                                                             | 59.0 | 15.2  |
| 6              | .940                                            | .102                                                         | .735    | .367    | 65.2                          | 73.5                                                             | 58.5 | 15.0  |
| 7              | .957                                            | .125                                                         | .751    | .374    | 64.7                          | 73.7                                                             | 57.9 | 15.8  |
| 8              | .984                                            | .159                                                         | .783    | .376    | 67.0                          | 75.0                                                             | 60.5 | 14.5  |
| 9              | 30.006                                          | .183                                                         | .801    | .382    | 71.4                          | 79.0                                                             | 64.4 | 14.6  |
| 10             | .015                                            | .194                                                         | .807    | .387    | 75.7                          | 83.0                                                             | 66.4 | 16.6  |
| 11             | .004                                            | .182                                                         | .798    | .384    | 78.9                          | 86.8                                                             | 67.5 | 19.3  |
| Noon.          | 29.975                                          | .147                                                         | .770    | .377    | 81.5                          | 89.4                                                             | 69.0 | 20.4  |
| 1              | .944                                            | .119                                                         | .737    | .382    | 83.2                          | 92.0                                                             | 71.3 | 20.7  |
| 2              | .913                                            | .085                                                         | .708    | .377    | 84.1                          | 93.2                                                             | 73.3 | 19.9  |
| 3              | .892                                            | .067                                                         | .696    | .371    | 85.0                          | 93.5                                                             | 74.0 | 19.5  |
| 4              | .881                                            | .057                                                         | .686    | .371    | 84.6                          | 92.4                                                             | 74.6 | 17.8  |
| 5              | .881                                            | .049                                                         | .686    | .363    | 83.3                          | 90.0                                                             | 74.0 | 16.0  |
| 6              | .890                                            | .057                                                         | .688    | .369    | 79.7                          | 86.4                                                             | 70.5 | 15.9  |
| 7              | .902                                            | .076                                                         | .714    | .362    | 76.3                          | 82.7                                                             | 69.0 | 13.7  |
| 8              | .921                                            | .097                                                         | .740    | .357    | 74.3                          | 80.4                                                             | 67.0 | 13.4  |
| 9              | .935                                            | .107                                                         | .757    | .350    | 72.4                          | 79.0                                                             | 65.5 | 13.5  |
| 10             | .942                                            | .110                                                         | .763    | .347    | 71.3                          | 78.5                                                             | 64.0 | 14.5  |
| 11             | .937                                            | .114                                                         | .747    | .367    | 70.3                          | 78.4                                                             | 63.0 | 15.4  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb  
Thermometer Means are derived from the observations made at the several  
hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of February 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 65.1                            | 4.2                 | 61.7                | 7.6                          | 0.554                            | 6.09                                             | 1.74                                                                | 0.78                                                                |
| 1              | 64.5                            | 4.1                 | 61.2                | 7.4                          | .544                             | .01                                              | .06                                                                 | .78                                                                 |
| 2              | 64.0                            | 3.8                 | 61.0                | 6.8                          | .541                             | 5.98                                             | .50                                                                 | .80                                                                 |
| 3              | 63.6                            | 3.6                 | 60.7                | 6.5                          | .536                             | .92                                              | .43                                                                 | .81                                                                 |
| 4              | 63.1                            | 3.4                 | 60.4                | 6.1                          | .530                             | .88                                              | .31                                                                 | .82                                                                 |
| 5              | 62.6                            | 3.2                 | 60.0                | 5.8                          | .523                             | .80                                              | .24                                                                 | .82                                                                 |
| 6              | 62.0                            | 3.2                 | 59.4                | 5.8                          | .513                             | .69                                              | .22                                                                 | .82                                                                 |
| 7              | 61.7                            | 3.0                 | 59.3                | 5.4                          | .511                             | .68                                              | .12                                                                 | .84                                                                 |
| 8              | 63.0                            | 4.0                 | 59.8                | 7.2                          | .520                             | .75                                              | .65                                                                 | .79                                                                 |
| 9              | 64.7                            | 6.7                 | 59.3                | 12.1                         | .511                             | .60                                              | 2.75                                                                | .67                                                                 |
| 10             | 66.1                            | 9.6                 | 59.4                | 18.3                         | .513                             | .58                                              | 3.93                                                                | .69                                                                 |
| 11             | 66.8                            | 12.1                | 58.3                | 20.6                         | .494                             | .33                                              | 5.14                                                                | .61                                                                 |
| Noon.          | 67.1                            | 14.4                | 57.0                | 24.5                         | .473                             | .08                                              | 6.23                                                                | .45                                                                 |
| 1              | 67.5                            | 15.7                | 56.5                | 26.7                         | .465                             | 4.98                                             | .91                                                                 | .42                                                                 |
| 2              | 67.9                            | 16.5                | 56.3                | 28.1                         | .462                             | .94                                              | 7.37                                                                | .40                                                                 |
| 3              | 68.0                            | 17.0                | 56.1                | 28.9                         | .459                             | .90                                              | .63                                                                 | .39                                                                 |
| 4              | 67.8                            | 16.8                | 56.0                | 28.6                         | .458                             | .88                                              | .51                                                                 | .39                                                                 |
| 5              | 68.3                            | 15.0                | 57.8                | 25.5                         | .486                             | 5.20                                             | 6.73                                                                | .44                                                                 |
| 6              | 68.9                            | 10.8                | 61.3                | 18.4                         | .546                             | .90                                              | 4.82                                                                | .55                                                                 |
| 7              | 68.0                            | 8.3                 | 62.2                | 14.1                         | .563                             | 6.11                                             | 3.58                                                                | .63                                                                 |
| 8              | 67.2                            | 7.1                 | 62.2                | 12.1                         | .563                             | .14                                              | 2.98                                                                | .67                                                                 |
| 9              | 66.3                            | 6.1                 | 61.4                | 11.0                         | .548                             | .00                                              | .60                                                                 | .70                                                                 |
| 10             | 66.1                            | 5.2                 | 61.9                | 9.4                          | .557                             | .12                                              | .21                                                                 | .74                                                                 |
| 11             | 65.8                            | 4.5                 | 62.2                | 8.1                          | .563                             | .19                                              | 1.89                                                                | .77                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of February 1873.*

Solar Radiation. Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 2½ ft. above Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                   |
|-------|-----------------------|---------------------------------|-----------------------|---------------|-----------------|----------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                              |
|       | °                     | inches                          |                       | lb            | Miles           |                                                                                              |
| 1     | 134.0                 | ...                             | N E & N W             | ...           | 76.0            | B.                                                                                           |
| 2     | 131.2                 | ...                             | N W & N E             | ...           | 98.2            | B to 6 A. M. \i to 10 A. M.,<br>B to 11 P. M. Slightly foggy from<br>8 to 10 P. M.           |
| 3     | 130.8                 | ...                             | N E                   | ...           | 126.5           | B. to 2 P. M. \i to 6 P. M. B<br>to 11 P. M.,                                                |
| 4     | 125.0                 | ...                             | N E & W by N          | ...           | 124.5           | \i & \i to 1 A. M. B to 4 A.<br>M. \i to 9 A. M. S to 3 P. M. \i<br>to 6 P. M. B to 11 P. M. |
| 5     | 135.0                 | ...                             | W N W & N W           | ...           | 60.2            | B. Slightly foggy from 7 to 9<br>P. M.                                                       |
| 6     | 133.3                 | ...                             | N W                   | ...           | 44.4            | B. Slightly foggy at 7 & 8 A.<br>M. & 8 & 9 P. M.                                            |
| 7     | 138.0                 | ...                             | W & W N W             | ...           | 34.5            | B. Slightly foggy from 5 to 7<br>A. M.                                                       |
| 8     | 138.0                 | ...                             | W N W & W by N        | ...           | 26.5            | B. Slightly foggy at 5 & 6 A.<br>M.                                                          |
| 9     | 141.0                 | ...                             | W S W & S S W         | ...           | 50.8            | B to 2 P. M., \i to 5 P. M. B<br>to 11 P. M. Slightly foggy from 4<br>to 7 A. M.             |
| 10    | 135.0                 | ...                             | N & N by W            | ...           | 102.6           | B. Slightly foggy from 8 to<br>11 P. M.                                                      |
| 11    | 139.0                 | ...                             | N N E & N W           | ...           | 75.6            | B. Slightly foggy at midnight<br>& 1 A. M., & from 8 to 10 P. M.                             |
| 12    | 136.5                 | ...                             | N N E & N E           | 0.2           | 101.4           | B Foggy from 8 to 11 P. M.                                                                   |
| 13    | 138.7                 | ...                             | N E & N W             | 0.2           | 90.6            | B Foggy from midnight to 6 A.<br>M.                                                          |
| 14    | 135.0                 | ...                             | N W                   | ...           | 102.9           | B Slightly foggy at 9 & 10 P.<br>M.                                                          |
| 15    | 135.0                 | ...                             | N W & E N E           | ...           | 102.0           | B.                                                                                           |
| 16    | 140.5                 | ...                             | W N W & N N W         | ...           | 79.0            | B. Slightly foggy at 8 P. M.                                                                 |
| 17    | 142.5                 | ...                             | W by S & S S W        | ...           | 74.0            | B to 3 P. M. \i to 7 P. M. B<br>to 11 P. M. Foggy from 5 to 9 A.<br>M.                       |
| 18    | 144.0                 | ...                             | S S W                 | ...           | 84.5            | B to 8 A. M. \i to 6 P. M. B to<br>11 P. M. Foggy from 4 to 7 A. M.                          |
| 19    | 142.0                 | ...                             | W S W & N W           | ...           | 79.9            | Chiefly \i.                                                                                  |

\i Cirri,—i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i Nimbi,  
\i Cirro-cumuli, B clear, S strati, O overcast, T thunder, L lightning,  
R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of February 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge<br>1½ ft. above<br>Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                    |
|-------|-----------------------|---------------------------------------|-----------------------|---------------|-----------------|-------------------------------------------------------------------------------|
|       |                       |                                       | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                               |
|       | °                     | inches                                |                       | lb            | Mile.           |                                                                               |
| 20    | 141.5                 | ...                                   | S S W                 | ...           | 80.5            | \\i to 3 P. M. B to 11 P. M.                                                  |
| 21    | 142.8                 | ...                                   | W by S                | ...           | 115.3           | B to 8 A. M., \\i to 11 A. M.<br>\\i to 8 P. M. B to 11 P. M.                 |
| 22    | 141.0                 | ...                                   | W & S S W             | ...           | 56.8            | B to 1 A. M. \\i to 7 A. M. B<br>to 11 P. M.                                  |
| 23    | 142.2                 | ...                                   | S S W & S             | ...           | 107.6           | B to 2 A. M. \\i to 4 A. M. S<br>to 9 A. M. B to 11 P. M. Foggy<br>at 6 A. M. |
| 24    | 145.0                 | ...                                   | W by N & W by S       | ...           | 119.2           | B. Slightly foggy from 3 to 7<br>A. M.                                        |
| 25    | 144.0                 | ...                                   | S                     | ...           | 102.7           | B to 4 A. M. S to 6 A. M. B to<br>2 P. M. \\i to 4 P. M. B to 11 P.<br>M.     |
| 26    | 145.0                 | ...                                   | S, S W & S S W        | 0.8           | 183.5           | B.                                                                            |
| 27    | 141.5                 | ...                                   | S W & S by W          | 0.8           | 252.2           | B.                                                                            |
| 28    | 138.0                 | ...                                   | N by W & W by N       | ...           | 199.7           | B.                                                                            |

\\i Cirri,—i Strati, \\i Cumuli, \\i Cirro-strati, \\i Cumulo-strati, \\i Nimbi,  
\\i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning  
R. rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of February 1873.*

MONTHLY RESULTS.

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|                                                                      | Inches. |
|----------------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..                    | 29.935  |
| Max. height of the Barometer occurred at 10 A. M. on the 3rd ...     | 30.194  |
| Min. height of the Barometer occurred at 4 & 5 P. M. on the 24th ... | 29.686  |
| Extreme range of the Barometer during the month ... ..               | 0.508   |
| Mean of the daily Max. Pressures ... ..                              | 30.016  |
| Ditto ditto Min. ditto ... ..                                        | 29.872  |
| Mean daily range of the Barometer during the month ... ..            | 0.144   |

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|                                                             | °    |
|-------------------------------------------------------------|------|
| Mean Dry Bulb Thermometer for the month ... ..              | 73.9 |
| Max. Temperature occurred at 3 P. M. on the 27th ... ..     | 93.5 |
| Min. Temperature occurred at 7 A. M. on the 25th ... ..     | 57.9 |
| Extreme range of the Temperature during the month ... ..    | 35.6 |
| Mean of the daily Max. Temperature ... ..                   | 85.1 |
| Ditto ditto Min. ditto, ... ..                              | 64.6 |
| Mean daily range of the Temperature during the month ... .. | 20.5 |

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|                                                                |      |
|----------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..                 | 65.7 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ...  | 8.2  |
| Computed Mean Dew-point for the month ... ..                   | 60.0 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ... .. | 13.9 |

|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.523   |

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|                                                                        | Troy grain. |
|------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                             | 5.71        |
| Additional Weight of Vapour required for complete saturation ...       | 3.30        |
| Mean degree of humidity for the month, complete saturation being unity | 0.61        |

|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 138.4 |

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|                                                                                                      | Inches.       |
|------------------------------------------------------------------------------------------------------|---------------|
| Rained No. day,—Max. fall of rain during 24 hours ... ..                                             | Nil           |
| Total amount of rain during the month ... ..                                                         | Nil           |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month ... .. | Nil           |
| Prevailing direction of the Wind ... ..                                                              | N. W. & N. E. |

\* Height 70 feet 10 inches above ground.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of March 1873.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at 32° Fahr. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|-------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                 | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                         | Inches.                                   | Inches. | Inches. | °                             | °                                             | °    | °     |
| 1     | 29.873                                          | 29.950                                    | 29.830  | 0.120   | 74.8                          | 86.4                                          | 64.8 | 21.6  |
| 2     | .858                                            | .937                                      | .789    | .148    | 75.7                          | 86.5                                          | 66.0 | 20.5  |
| 3     | .830                                            | .885                                      | .774    | .111    | 78.4                          | 88.3                                          | 70.7 | 17.6  |
| 4     | .898                                            | .920                                      | .829    | .161    | 77.0                          | 86.5                                          | 68.5 | 18.0  |
| 5     | .892                                            | .972                                      | .813    | .151    | 78.8                          | 88.0                                          | 71.0 | 17.0  |
| 6     | .923                                            | .998                                      | .884    | .114    | 72.7                          | 75.0                                          | 70.0 | 5.0   |
| 7     | .891                                            | 30.027                                    | .833    | .194    | 74.9                          | 84.5                                          | 68.0 | 16.5  |
| 8     | .887                                            | 29.973                                    | .828    | .145    | 72.7                          | 81.0                                          | 66.6 | 14.4  |
| 9     | .954                                            | 30.021                                    | .891    | .130    | 72.3                          | 80.5                                          | 65.0 | 15.5  |
| 10    | .951                                            | .030                                      | .880    | .150    | 73.2                          | 83.5                                          | 63.8 | 19.7  |
| 11    | .910                                            | .003                                      | .829    | .174    | 75.9                          | 86.5                                          | 67.0 | 19.5  |
| 12    | .856                                            | 29.931                                    | .776    | .155    | 79.1                          | 90.7                                          | 69.3 | 21.4  |
| 13    | .815                                            | .880                                      | .747    | .142    | 80.4                          | 89.8                                          | 73.0 | 16.8  |
| 14    | .865                                            | .556                                      | .792    | .164    | 77.4                          | 83.8                                          | 73.0 | 10.8  |
| 15    | .902                                            | .479                                      | .839    | .140    | 77.0                          | 89.0                                          | 68.5 | 20.5  |
| 16    | .908                                            | .980                                      | .859    | .121    | 79.5                          | 90.0                                          | 71.2 | 18.8  |
| 17    | .908                                            | .989                                      | .835    | .154    | 81.3                          | 91.6                                          | 73.0 | 18.6  |
| 18    | .884                                            | .971                                      | .816    | .155    | 80.8                          | 91.4                                          | 72.0 | 19.4  |
| 19    | .823                                            | .904                                      | .744    | .160    | 81.6                          | 93.5                                          | 72.8 | 20.7  |
| 20    | .781                                            | .819                                      | .701    | .148    | 82.8                          | 95.0                                          | 74.5 | 20.5  |
| 21    | .803                                            | .878                                      | .731    | .147    | 83.1                          | 94.7                                          | 75.5 | 19.2  |
| 22    | .784                                            | .853                                      | .702    | .151    | 84.6                          | 97.8                                          | 75.0 | 22.8  |
| 23    | .780                                            | .843                                      | .705    | .138    | 85.8                          | 99.0                                          | 76.5 | 22.5  |
| 24    | .798                                            | .890                                      | .731    | .159    | 85.8                          | 97.0                                          | 77.0 | 20.0  |
| 25    | .822                                            | .915                                      | .756    | .159    | 85.1                          | 95.0                                          | 78.0 | 17.0  |
| 26    | .786                                            | .849                                      | .724    | .125    | 84.7                          | 95.5                                          | 77.6 | 17.9  |
| 27    | .792                                            | .863                                      | .724    | .139    | 83.4                          | 92.2                                          | 77.0 | 15.2  |
| 28    | .819                                            | .884                                      | .763    | .121    | 83.4                          | 93.0                                          | 76.0 | 17.0  |
| 29    | .896                                            | .968                                      | .833    | .135    | 83.1                          | 92.4                                          | 77.0 | 15.4  |
| 30    | .896                                            | .974                                      | .822    | .152    | 82.9                          | 93.2                                          | 75.5 | 17.7  |
| 31    | .865                                            | .944                                      | .770    | .174    | 84.3                          | 97.5                                          | 75.7 | 21.8  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.



*Abstract of the Results of the Hourly Meteorological Observations,  
taken at the Surveyor General's Office, Calcutta,  
in the month of March 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 62.8                            | 12.0                | 54.4                | 20.4                         | 0.434                            | 4.72                                             | 4.54                                                                | 0.51                                                                |
| 2     | 66.5                            | 9.2                 | 60.1                | 15.6                         | .525                             | 5.70                                             | 3.81                                                                | .60                                                                 |
| 3     | 71.9                            | 6.5                 | 67.3                | 11.1                         | .666                             | 7.21                                             | .10                                                                 | .70                                                                 |
| 4     | 69.1                            | 7.9                 | 63.6                | 13.4                         | .590                             | 6.40                                             | .49                                                                 | .65                                                                 |
| 5     | 72.0                            | 6.8                 | 67.2                | 11.6                         | .664                             | 7.17                                             | .27                                                                 | .69                                                                 |
| 6     | 68.6                            | 4.1                 | 65.3                | 7.4                          | .623                             | 6.83                                             | 1.85                                                                | .79                                                                 |
| 7     | 69.1                            | 5.8                 | 65.0                | 9.9                          | .617                             | .73                                              | 2.55                                                                | .73                                                                 |
| 8     | 67.5                            | 5.2                 | 63.3                | 9.4                          | .584                             | .89                                              | .29                                                                 | .74                                                                 |
| 9     | 64.0                            | 8.3                 | 57.4                | 14.9                         | .480                             | 5.25                                             | 3.33                                                                | .61                                                                 |
| 10    | 64.7                            | 8.5                 | 57.9                | 15.3                         | .488                             | .33                                              | .49                                                                 | .60                                                                 |
| 11    | 67.1                            | 8.8                 | 60.9                | 15.0                         | .539                             | .86                                              | .71                                                                 | .61                                                                 |
| 12    | 71.7                            | 7.4                 | 66.5                | 12.6                         | .618                             | 7.00                                             | .53                                                                 | .67                                                                 |
| 13    | 74.0                            | 6.4                 | 69.5                | 10.9                         | .715                             | .71                                              | .23                                                                 | .71                                                                 |
| 14    | 71.6                            | 5.8                 | 67.5                | 9.9                          | .670                             | .27                                              | 2.74                                                                | .73                                                                 |
| 15    | 69.0                            | 8.9                 | 62.8                | 15.1                         | .574                             | 6.22                                             | 3.94                                                                | .61                                                                 |
| 16    | 69.9                            | 9.6                 | 63.2                | 16.3                         | .582                             | .28                                              | 4.38                                                                | .59                                                                 |
| 17    | 70.0                            | 11.3                | 62.1                | 19.2                         | .561                             | .03                                              | 5.21                                                                | .54                                                                 |
| 18    | 70.0                            | 10.8                | 62.4                | 18.4                         | .567                             | .10                                              | 4.97                                                                | .55                                                                 |
| 19    | 72.5                            | 9.1                 | 66.1                | 15.5                         | .610                             | .87                                              | .47                                                                 | .61                                                                 |
| 20    | 75.2                            | 7.6                 | 69.9                | 12.9                         | .725                             | 7.77                                             | 3.98                                                                | .66                                                                 |
| 21    | 76.7                            | 6.4                 | 72.2                | 10.9                         | .781                             | 8.36                                             | .50                                                                 | .71                                                                 |
| 22    | 75.9                            | 8.7                 | 69.8                | 14.8                         | .722                             | 7.71                                             | 4.68                                                                | .62                                                                 |
| 23    | 76.5                            | 9.3                 | 70.0                | 15.8                         | .727                             | .74                                              | 5.09                                                                | .60                                                                 |
| 24    | 75.5                            | 10.3                | 68.3                | 17.5                         | .683                             | .33                                              | .50                                                                 | .57                                                                 |
| 25    | 75.8                            | 9.6                 | 69.1                | 16.3                         | .706                             | .53                                              | .15                                                                 | .59                                                                 |
| 26    | 74.4                            | 10.3                | 67.2                | 17.5                         | .664                             | .09                                              | .33                                                                 | .57                                                                 |
| 27    | 77.8                            | 5.6                 | 73.9                | 9.5                          | .824                             | 8.83                                             | 3.13                                                                | .74                                                                 |
| 28    | 77.6                            | 5.8                 | 73.5                | 9.9                          | .814                             | .72                                              | .24                                                                 | .73                                                                 |
| 29    | 76.7                            | 6.4                 | 72.2                | 10.9                         | .781                             | .36                                              | .50                                                                 | .71                                                                 |
| 30    | 75.1                            | 7.8                 | 69.6                | 13.3                         | .717                             | 7.69                                             | 4.10                                                                | .65                                                                 |
| 31    | 75.8                            | 8.5                 | 69.8                | 14.5                         | .722                             | .71                                              | .57                                                                 | .63                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of March 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 29.864                                          | 29.984                                                       | 29.794  | 0.190   | 75.3                          | 81.0                                                             | 67.6 | 13.4  |
| 1              | .853                                            | .975                                                         | .781    | .194    | 74.8                          | 81.0                                                             | 66.8 | 14.2  |
| 2              | .843                                            | .965                                                         | .768    | .197    | 74.2                          | 80.8                                                             | 66.0 | 14.8  |
| 3              | .835                                            | .952                                                         | .749    | .203    | 73.7                          | 80.5                                                             | 65.5 | 15.0  |
| 4              | .833                                            | .941                                                         | .750    | .191    | 73.2                          | 80.3                                                             | 65.0 | 15.3  |
| 5              | .850                                            | .952                                                         | .762    | .190    | 72.6                          | 80.0                                                             | 64.0 | 16.0  |
| 6              | .869                                            | .968                                                         | .782    | .186    | 72.1                          | 79.0                                                             | 63.8 | 15.2  |
| 7              | .863                                            | .980                                                         | .803    | .177    | 72.2                          | 78.0                                                             | 63.9 | 14.1  |
| 8              | .916                                            | 30.003                                                       | .827    | .176    | 74.6                          | 80.5                                                             | 67.5 | 13.0  |
| 9              | .933                                            | .023                                                         | .843    | .180    | 78.2                          | 84.1                                                             | 68.4 | 15.7  |
| 10             | .937                                            | .030                                                         | .842    | .188    | 81.4                          | 88.0                                                             | 72.0 | 16.0  |
| 11             | .926                                            | .022                                                         | .831    | .191    | 84.3                          | 91.8                                                             | 74.0 | 17.8  |
| Noon.          | .901                                            | .004                                                         | .802    | .202    | 86.6                          | 94.5                                                             | 74.8 | 19.7  |
| 1              | .867                                            | 20.970                                                       | .761    | .209    | 89.1                          | 96.6                                                             | 73.7 | 22.9  |
| 2              | .837                                            | .947                                                         | .736    | .211    | 89.1                          | 98.0                                                             | 73.0 | 25.0  |
| 3              | .814                                            | .936                                                         | .716    | .220    | 89.6                          | 99.0                                                             | 73.5 | 25.5  |
| 4              | .801                                            | .924                                                         | .701    | .223    | 89.5                          | 99.0                                                             | 74.2 | 24.8  |
| 5              | .793                                            | .916                                                         | .702    | .214    | 87.9                          | 98.0                                                             | 75.0 | 23.0  |
| 6              | .805                                            | .925                                                         | .723    | .202    | 84.9                          | 93.0                                                             | 74.5 | 18.5  |
| 7              | .818                                            | .940                                                         | .736    | .204    | 81.8                          | 87.5                                                             | 73.6 | 13.9  |
| 8              | .841                                            | .966                                                         | .767    | .199    | 79.7                          | 85.3                                                             | 72.8 | 12.5  |
| 9              | .860                                            | .987                                                         | .782    | .205    | 78.3                          | 84.0                                                             | 71.3 | 12.7  |
| 10             | .873                                            | .997                                                         | .805    | .192    | 77.0                          | 82.4                                                             | 70.0 | 12.4  |
| 11             | .872                                            | .995                                                         | .803    | .192    | 76.1                          | 82.0                                                             | 68.9 | 13.1  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb  
Thermometer Means are derived from the observations made at the several  
hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of March 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 71.8                            | 3.5                 | 60.3                | 6.0                          | .0711                            | 7.74                                             | 1.66                                                                | .82                                                                 |
| 1              | 71.5                            | 3.3                 | 60.2                | 5.6                          | .709                             | .72                                              | .54                                                                 | .83                                                                 |
| 2              | 71.3                            | 2.9                 | 60.3                | 4.9                          | .711                             | .75                                              | .34                                                                 | .85                                                                 |
| 3              | 70.9                            | 2.8                 | 68.9                | 4.8                          | .701                             | .66                                              | .30                                                                 | .86                                                                 |
| 4              | 70.6                            | 2.6                 | 68.5                | 4.7                          | .692                             | .57                                              | .25                                                                 | .86                                                                 |
| 5              | 70.1                            | 2.5                 | 68.1                | 4.5                          | .684                             | .47                                              | .19                                                                 | .86                                                                 |
| 6              | 69.7                            | 2.4                 | 67.8                | 4.3                          | .677                             | .42                                              | .11                                                                 | .87                                                                 |
| 7              | 69.8                            | 2.4                 | 67.9                | 4.3                          | .679                             | .45                                              | .10                                                                 | .87                                                                 |
| 8              | 71.0                            | 3.6                 | 68.5                | 6.1                          | .692                             | .56                                              | .64                                                                 | .82                                                                 |
| 9              | 72.1                            | 6.1                 | 67.8                | 10.4                         | .677                             | .33                                              | 2.92                                                                | .72                                                                 |
| 10             | 72.5                            | 8.9                 | 66.3                | 15.1                         | .614                             | 6.49                                             | 4.33                                                                | .62                                                                 |
| 11             | 72.6                            | 11.7                | 64.4                | 19.9                         | .605                             | .47                                              | 5.81                                                                | .53                                                                 |
| Noon.          | 72.2                            | 14.4                | 63.6                | 23.0                         | .590                             | .27                                              | 6.87                                                                | .48                                                                 |
| 1              | 72.2                            | 15.9                | 62.7                | 25.4                         | .572                             | .08                                              | 7.64                                                                | .44                                                                 |
| 2              | 72.1                            | 17.0                | 61.9                | 27.2                         | .557                             | 5.90                                             | 8.22                                                                | .42                                                                 |
| 3              | 72.0                            | 17.6                | 61.4                | 28.2                         | .548                             | .80                                              | .53                                                                 | .41                                                                 |
| 4              | 72.1                            | 17.4                | 61.7                | 27.8                         | .554                             | .85                                              | .44                                                                 | .41                                                                 |
| 5              | 72.2                            | 15.7                | 62.8                | 25.1                         | .574                             | 6.10                                             | 7.54                                                                | .45                                                                 |
| 6              | 73.0                            | 11.9                | 64.7                | 20.2                         | .611                             | .53                                              | 5.96                                                                | .52                                                                 |
| 7              | 72.8                            | 9.0                 | 66.5                | 15.3                         | .618                             | .97                                              | 4.43                                                                | .61                                                                 |
| 8              | 72.8                            | 6.9                 | 68.0                | 11.7                         | .681                             | 7.35                                             | 3.37                                                                | .69                                                                 |
| 9              | 72.6                            | 5.7                 | 68.6                | 9.7                          | .695                             | .52                                              | 2.76                                                                | .73                                                                 |
| 10             | 72.5                            | 4.5                 | 69.3                | 7.7                          | .711                             | .70                                              | .19                                                                 | .78                                                                 |
| 11             | 72.3                            | 3.8                 | 69.6                | 6.5                          | .717                             | .79                                              | 1.84                                                                | .81                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of March 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                   |               |                 | General aspect of the Sky.                                                                                                                                                         |
|-------|-----------------------|---------------------------------|-------------------------|---------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction.   | Max. Pressure | Daily Velocity. |                                                                                                                                                                                    |
|       | °                     | Inches                          |                         | lb            | Miles           |                                                                                                                                                                                    |
| 1     | 139.5                 | ...                             | Variable.               | ...           | 75.6            | B.                                                                                                                                                                                 |
| 2     | 140.5                 | ...                             | N N W & S               | ...           | 56.5            | B.                                                                                                                                                                                 |
| 3     | 142.5                 | ...                             | S                       | ...           | 122.8           | B to 8 A. M., ~i to 4 P. M. B to 11 P. M.                                                                                                                                          |
| 4     | 139.5                 | ...                             | S & S E                 | 0.8           | 216.8           | B to 3 A. M., ~i to 2 P. M., ~i to 11 P. M.                                                                                                                                        |
| 5     | 141.3                 | ...                             | S by E & S              | 0.5           | 90.9            | Clouds of different kinds.                                                                                                                                                         |
| 6     | —                     | 0.02                            | Variable.               | ...           | 159.6           | S. to 5 A. M. O to 7 P. M., ~i to 9 P. M., ~i to 11 P. M. Slightly foggy at 11 P. M. Light R between 6 & 7, at 12 A. M., 3 & 5½ P. M.                                              |
| 7     | 137.5                 | 0.10                            | S & Variable.           | ...           | 96.2            | Clouds of different kinds. Tat 8¼ A. M. Light R between 3 & 4 & at 9 A. M.                                                                                                         |
| 8     | 138.2                 | 1.06                            | Variable.               | 6.0           | 138.1           | S to A. M. O to 9 A. M., ~i & ~i to 7 P. M. B to 11 P. M. High wind between 1¼ & 2 A. M. Slightly foggy from 8 to 10 P. M. Lightning from midnight to 2 A. M. R from 2½ to 7 A. M. |
| 9     | 136.5                 | ...                             | W, N W & N by E         | ...           | 109.4           | B.                                                                                                                                                                                 |
| 10    | 138.0                 | ...                             | [W N W                  | ...           | 116.0           | B.                                                                                                                                                                                 |
| 11    | 139.0                 | ...                             | E S E, E by N & E & N W | ...           | 75.5            | B to 11 A. M., ~i to 3 P. M. B to 11 P. M. Slightly foggy from 5 to 7 A. M.                                                                                                        |
| 12    | 145.0                 | ...                             | S by W                  | ...           | 120.9           | B. Slightly foggy at 6 A. M.                                                                                                                                                       |
| 13    | 144.0                 | ...                             | S S W                   | ...           | 148.8           | B to 11 A. M., ~i & ~i to 2 P. M. B to 4 P. M., ~i to 11 P. M.                                                                                                                     |
| 14    | 139.4                 | ...                             | S S W & N W             | 2.8           | 134.9           | B to 5 A. M., ~i to 10 A. M. O to 8 P. M., ~i to 11 P. M. Brisk wind at 2½ P. M. D at 3½ P. M.                                                                                     |
| 15    | 142.0                 | ...                             | S & S S W               | ...           | 146.1           | ~i to 4 A. M. B to 8 A. M. ~i to 11 P. M.                                                                                                                                          |
| 16    | 144.0                 | ...                             | Variable.               | ...           | 91.2            | O to 6 A. M. ~i to 10 A. M. B to 6 P. M. ~i to 11 P. M.                                                                                                                            |

~i Cirri,—i Strati, ~i Cumuli, ~i Cirro-strati, ~i Cumulo-strati, ~i Nimib, ~i Cirro-cumuli, B clear, S straton, O overcast, T thunder, L lightning, R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of March 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                |               |                 | General aspect of the Sky.                                                                                 |
|-------|-----------------------|---------------------------------|----------------------|---------------|-----------------|------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Preniling direction. | Max. Pressure | Daily Velocity. |                                                                                                            |
|       | °                     | Inches                          |                      | lb            | Mile.           |                                                                                                            |
| 17    | 142.5                 | ...                             | S by E & E           | ...           | 94.4            | ↘ i to 4 A. M. ↘ i to 7 A. M. ↘ i to 2 P. M. ↘ i to 6 P. M. B to 11 P. M.                                  |
| 18    | 142.0                 | ...                             | S, S S W & W N W     | ...           | 104.8           | B.                                                                                                         |
| 19    | 141.0                 | ...                             | S W & S              | ...           | 135.1           | B to 3 P. M. ↘ i to 5 P. M. B to 11 P. M.                                                                  |
| 20    | 140.2                 | ...                             | S & S W              | 0.4           | 246.8           | B to 1 P. M. ↘ i to 4 P. M. B to 11 P. M.                                                                  |
| 21    | 141.8                 | ...                             | S by W & S W         | 0.2           | 329.9           | Chiefly B.                                                                                                 |
| 22    | 145.0                 | ...                             | S S E & S S W        | 0.2           | 115.2           | B.                                                                                                         |
| 23    | 143.0                 | ...                             | S, S W & N W         | 0.2           | 191.1           | B.                                                                                                         |
| 24    | 144.5                 | ...                             | W S W & S by W       | ...           | 165.5           | B. Foggy at 6 & 7 A. M.                                                                                    |
| 25    | 141.5                 | ...                             | Variable.            | ...           | 122.3           | S to 6 A. M. B to 11 P. M.                                                                                 |
| 26    | 140.0                 | ...                             | S by W & S           | ...           | 137.8           | B.                                                                                                         |
| 27    | 137.0                 | ...                             | S & S by E           | 0.2           | 191.7           | B.                                                                                                         |
| 28    | 139.0                 | ...                             | S by E & S           | ...           | 216.7           | B to 6 A. M. S to 10 A. M. B to 11 P. M.                                                                   |
| 29    | 139.0                 | ...                             | S                    | ...           | 180.2           | B to 4 A. M. S to 8 A. M. B to 11 P. M.                                                                    |
| 30    | 138.8                 | ...                             | S by E & S by W      | ...           | 173.1           | B to 11 A. M., clouds of different kinds to 8 P. M. B to 11 P. M. Foggy from 5 to 7 A. M. T & L at 7 P. M. |
| 31    | 142.7                 | ...                             | S by E & S           | ...           | 224.7           | B.                                                                                                         |

↘ i Cirri,—i Strati, ↘ i Cumuli, ↘ i Cirro-strati, ↘ i Cumulo-strati, ↘ i Nimbi,  
↘ i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning  
R. rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of March 1873.*

MONTHLY RESULTS.

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|                                                                   | Inches. |
|-------------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..                 | 29.860  |
| Max. height of the Barometer occurred at 10 A. M. on the 10th ... | 30.030  |
| Min. height of the Barometer occurred at 4 P. M. on the 20th ...  | 29.701  |
| Extreme range of the Barometer during the month ... ..            | 0.329   |
| Mean of the daily Max. Pressures ... ..                           | 29.939  |
| Ditto ditto Min. ditto ... ..                                     | 29.792  |
| Mean daily range of the Barometer during the month ... ..         | 0.147   |

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|                                                             | °    |
|-------------------------------------------------------------|------|
| Mean Dry Bulb Thermometer for the month ... ..              | 79.8 |
| Max. Temperature occurred at 3 & 4 P. M. on the 23rd ... .. | 99.0 |
| Min. Temperature occurred at 6 A. M. on the 10th ... ..     | 63.8 |
| Extreme range of the Temperature during the month ... ..    | 35.2 |
| Mean of the daily Max. Temperature ... ..                   | 90.0 |
| Ditto ditto Min. ditto, ... ..                              | 71.9 |
| Mean daily range of the Temperature during the month ... .. | 18.1 |

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|                                                                |      |
|----------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..                 | 71.8 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ...  | 8.0  |
| Computed Mean Dew-point for the month ... ..                   | 66.2 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ... .. | 13.6 |

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|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.642   |

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|                                                                        | Troy grain. |
|------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                             | 6.92        |
| Additional Weight of Vapour required for complete saturation ...       | 3.83        |
| Mean degree of humidity for the month, complete saturation being unity | 0.64        |

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|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 140.8 |

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|                                                                                                      | Inches. |
|------------------------------------------------------------------------------------------------------|---------|
| Rained 4 days,—Max. fall of rain during 24 hours ... ..                                              | 1.06    |
| Total amount of rain during the month ... ..                                                         | 1.18    |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month ... .. | 0.98    |
| Prevailing direction of the Wind ... .. S. & S. by E.                                                |         |

\* Height 70 feet 10 inches above ground.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of April 1873.*

Latitude  $22^{\circ} 33' 1''$  North. Longitude  $88^{\circ} 20' 31''$  East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at 32° Fahr. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|-------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                 | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                         | Inches.                                   | Inches. | Inches. | °                             | °                                             | °    | °     |
| 1     | 29.827                                          | 29.912                                    | 29.731  | 0.181   | 83.7                          | 94.7                                          | 76.0 | 18.7  |
| 2     | .780                                            | .818                                      | .703    | .115    | 83.6                          | 92.5                                          | 76.0 | 16.5  |
| 3     | .743                                            | .821                                      | .651    | .170    | 81.0                          | 94.0                                          | 78.5 | 15.5  |
| 4     | .678                                            | .749                                      | .609    | .140    | 84.6                          | 93.6                                          | 78.0 | 15.6  |
| 5     | .692                                            | .752                                      | .631    | .121    | 83.0                          | 87.0                                          | 80.2 | 6.8   |
| 6     | .765                                            | .846                                      | .695    | .151    | 82.9                          | 89.7                                          | 77.5 | 12.2  |
| 7     | .839                                            | .901                                      | .765    | .136    | 80.5                          | 87.3                                          | 76.6 | 10.7  |
| 8     | .837                                            | .933                                      | .762    | .171    | 81.0                          | 90.0                                          | 74.5 | 15.5  |
| 9     | .780                                            | .860                                      | .692    | .168    | 83.8                          | 91.0                                          | 75.0 | 16.0  |
| 10    | .726                                            | .809                                      | .654    | .155    | 86.1                          | 98.5                                          | 77.8 | 20.7  |
| 11    | .619                                            | .699                                      | .522    | .177    | 87.2                          | 102.0                                         | 78.2 | 23.8  |
| 12    | .561                                            | .631                                      | .494    | .137    | 89.3                          | 103.5                                         | 78.6 | 24.9  |
| 13    | .600                                            | .633                                      | .551    | .132    | 88.3                          | 101.9                                         | 80.3 | 21.6  |
| 14    | .616                                            | .736                                      | .585    | .151    | 88.1                          | 99.0                                          | 82.0 | 17.0  |
| 15    | .653                                            | .726                                      | .594    | .132    | 88.0                          | 99.7                                          | 80.2 | 19.5  |
| 16    | .716                                            | .788                                      | .663    | .125    | 87.6                          | 98.2                                          | 81.9 | 16.3  |
| 17    | .751                                            | .815                                      | .694    | .121    | 87.6                          | 99.7                                          | 80.0 | 19.7  |
| 18    | .787                                            | .867                                      | .712    | .125    | 85.9                          | 94.3                                          | 77.5 | 16.8  |
| 19    | .862                                            | .974                                      | .787    | .187    | 79.4                          | 87.4                                          | 71.7 | 15.7  |
| 20    | .833                                            | .908                                      | .773    | .135    | 77.1                          | 84.0                                          | 73.0 | 11.0  |
| 21    | .783                                            | .848                                      | .714    | .134    | 77.2                          | 85.5                                          | 71.0 | 14.5  |
| 22    | .735                                            | .804                                      | .650    | .154    | 82.1                          | 91.5                                          | 72.6 | 18.9  |
| 23    | .732                                            | .816                                      | .654    | .162    | 84.0                          | 93.5                                          | 78.4 | 15.1  |
| 24    | .762                                            | .838                                      | .653    | .185    | 85.0                          | 93.5                                          | 77.8 | 15.7  |
| 25    | .754                                            | .828                                      | .661    | .167    | 86.1                          | 94.3                                          | 80.5 | 13.8  |
| 26    | .715                                            | .777                                      | .634    | .143    | 86.7                          | 96.3                                          | 81.0 | 15.3  |
| 27    | .697                                            | .762                                      | .615    | .147    | 87.2                          | 96.0                                          | 81.0 | 15.0  |
| 28    | .694                                            | .757                                      | .608    | .149    | 84.2                          | 94.8                                          | 73.5 | 21.3  |
| 29    | .729                                            | .818                                      | .665    | .153    | 79.3                          | 84.2                                          | 75.0 | 9.2   |
| 30    | .692                                            | .755                                      | .599    | .156    | 80.4                          | 92.0                                          | 76.0 | 16.0  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of April 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 76.8                            | 6.9                 | 72.0                | 11.7                         | 0.776                            | 8.30                                             | 3.77                                                                | 0.69                                                                |
| 2     | 77.1                            | 6.5                 | 72.5                | 11.1                         | .787                             | .41                                              | .59                                                                 | .70                                                                 |
| 3     | 78.5                            | 5.5                 | 74.6                | 9.4                          | .813                             | 9.03                                             | .14                                                                 | .74                                                                 |
| 4     | 77.2                            | 7.4                 | 72.0                | 12.6                         | .776                             | 8.28                                             | 4.11                                                                | .67                                                                 |
| 5     | 78.0                            | 5.0                 | 74.5                | 8.5                          | .810                             | 9.01                                             | 2.81                                                                | .76                                                                 |
| 6     | 76.2                            | 6.7                 | 71.5                | 11.4                         | .763                             | 8.20                                             | 3.50                                                                | .70                                                                 |
| 7     | 75.5                            | 5.0                 | 72.0                | 8.5                          | .776                             | .35                                              | 2.63                                                                | .76                                                                 |
| 8     | 75.4                            | 5.6                 | 71.5                | 9.5                          | .763                             | .21                                              | .93                                                                 | .74                                                                 |
| 9     | 77.6                            | 6.2                 | 73.3                | 10.5                         | .809                             | .65                                              | 3.45                                                                | .72                                                                 |
| 10    | 78.8                            | 7.3                 | 73.7                | 12.4                         | .819                             | .74                                              | 4.21                                                                | .68                                                                 |
| 11    | 79.7                            | 7.5                 | 75.2                | 12.0                         | .860                             | 9.15                                             | .22                                                                 | .68                                                                 |
| 12    | 78.9                            | 10.4                | 72.7                | 16.6                         | .792                             | 8.38                                             | 5.83                                                                | .50                                                                 |
| 13    | 80.8                            | 7.5                 | 76.3                | 12.0                         | .890                             | 9.48                                             | 4.34                                                                | .69                                                                 |
| 14    | 81.8                            | 6.3                 | 78.0                | 10.1                         | .940                             | .99                                              | 3.73                                                                | .73                                                                 |
| 15    | 81.4                            | 6.6                 | 77.4                | 10.6                         | .922                             | .79                                              | .80                                                                 | .72                                                                 |
| 16    | 80.6                            | 7.0                 | 76.4                | 11.2                         | .893                             | .51                                              | 4.01                                                                | .70                                                                 |
| 17    | 80.1                            | 7.5                 | 75.6                | 12.0                         | .871                             | .25                                              | .27                                                                 | .68                                                                 |
| 18    | 79.8                            | 6.1                 | 75.5                | 10.4                         | .868                             | .27                                              | 3.60                                                                | .72                                                                 |
| 19    | 74.9                            | 4.5                 | 71.7                | 7.7                          | .768                             | 8.30                                             | 2.32                                                                | .78                                                                 |
| 20    | 73.5                            | 3.6                 | 71.0                | 6.1                          | .751                             | .15                                              | 1.77                                                                | .82                                                                 |
| 21    | 73.1                            | 4.1                 | 70.2                | 7.0                          | .732                             | 7.04                                             | 2.01                                                                | .80                                                                 |
| 22    | 76.0                            | 6.1                 | 71.7                | 10.4                         | .768                             | 8.26                                             | 3.25                                                                | .72                                                                 |
| 23    | 80.1                            | 4.8                 | 76.7                | 8.2                          | .902                             | 9.64                                             | 2.85                                                                | .77                                                                 |
| 24    | 79.4                            | 5.6                 | 75.5                | 9.5                          | .868                             | .27                                              | 3.26                                                                | .74                                                                 |
| 25    | 80.2                            | 6.2                 | 75.9                | 10.5                         | .879                             | .36                                              | .70                                                                 | .72                                                                 |
| 26    | 80.4                            | 6.3                 | 76.6                | 10.1                         | .899                             | .56                                              | .62                                                                 | .73                                                                 |
| 27    | 81.2                            | 6.0                 | 77.6                | 9.6                          | .928                             | .87                                              | .50                                                                 | .74                                                                 |
| 28    | 78.5                            | 5.7                 | 74.5                | 9.7                          | .840                             | .00                                              | .24                                                                 | .74                                                                 |
| 29    | 75.1                            | 4.2                 | 72.2                | 7.1                          | .781                             | 8.43                                             | 2.16                                                                | .80                                                                 |
| 30    | 76.6                            | 3.8                 | 73.9                | 6.5                          | .824                             | .88                                              | .06                                                                 | .81                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of April 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 29.745                                          | 29.870                                                       | 29.560  | 0.310   | 80.1                          | 83.5                                                             | 72.7 | 10.8  |
| 1              | .735                                            | .853                                                         | .515    | .308    | 79.8                          | 83.2                                                             | 72.4 | 10.8  |
| 2              | .723                                            | .841                                                         | .529    | .312    | 79.3                          | 82.8                                                             | 71.8 | 11.0  |
| 3              | .711                                            | .826                                                         | .518    | .308    | 79.0                          | 82.4                                                             | 71.5 | 10.9  |
| 4              | .710                                            | .838                                                         | .529    | .309    | 78.6                          | 82.0                                                             | 71.3 | 10.7  |
| 5              | .722                                            | .851                                                         | .544    | .307    | 78.4                          | 82.2                                                             | 71.0 | 11.2  |
| 6              | .740                                            | .876                                                         | .572    | .304    | 78.2                          | 82.0                                                             | 71.0 | 11.0  |
| 7              | .761                                            | .957                                                         | .598    | .359    | 78.8                          | 82.5                                                             | 71.5 | 11.0  |
| 8              | .787                                            | .974                                                         | .620    | .354    | 81.0                          | 85.0                                                             | 72.0 | 13.0  |
| 9              | .797                                            | .938                                                         | .625    | .313    | 83.9                          | 88.0                                                             | 73.1 | 14.9  |
| 10             | .802                                            | .942                                                         | .631    | .311    | 86.6                          | 91.7                                                             | 75.6 | 16.1  |
| 11             | .787                                            | .922                                                         | .622    | .300    | 88.9                          | 95.5                                                             | 76.7 | 18.8  |
| Noon.          | .771                                            | .892                                                         | .602    | .290    | 90.8                          | 98.5                                                             | 76.3 | 22.2  |
| 1              | .742                                            | .881                                                         | .574    | .307    | 92.2                          | 100.6                                                            | 80.0 | 20.6  |
| 2              | .712                                            | .857                                                         | .551    | .306    | 93.0                          | 102.5                                                            | 80.5 | 22.0  |
| 3              | .687                                            | .819                                                         | .526    | .323    | 92.7                          | 103.1                                                            | 74.7 | 28.7  |
| 4              | .673                                            | .835                                                         | .505    | .330    | 91.6                          | 103.5                                                            | 73.2 | 30.3  |
| 5              | .666                                            | .825                                                         | .494    | .331    | 89.7                          | 102.0                                                            | 75.0 | 27.0  |
| 6              | .677                                            | .851                                                         | .494    | .357    | 86.8                          | 97.5                                                             | 73.5 | 24.0  |
| 7              | .694                                            | .833                                                         | .513    | .320    | 81.5                          | 93.0                                                             | 75.0 | 18.9  |
| 8              | .717                                            | .816                                                         | .554    | .292    | 82.7                          | 84.4                                                             | 74.5 | 13.9  |
| 9              | .739                                            | .861                                                         | .581    | .280    | 81.8                          | 86.7                                                             | 74.0 | 12.7  |
| 10             | .753                                            | .878                                                         | .589    | .298    | 81.1                          | 85.4                                                             | 74.5 | 10.9  |
| 11             | .682                                            | .873                                                         | .574    | .299    | 80.4                          | 81.6                                                             | 73.0 | 11.6  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb  
Thermometer Means are derived from the observations made at the several  
hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta;  
in the month of April 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 77.1                            | 3.0                 | 75.0                | 5.1                          | 0.854                            | 9.22                                             | 1.62                                                                | 0.85                                                                |
| 1              | 76.8                            | 3.0                 | 74.7                | 5.1                          | .846                             | .14                                              | .61                                                                 | .85                                                                 |
| 2              | 76.6                            | 2.7                 | 74.7                | 4.6                          | .846                             | .14                                              | .45                                                                 | .86                                                                 |
| 3              | 76.4                            | 2.6                 | 74.6                | 4.4                          | .843                             | .13                                              | .37                                                                 | .87                                                                 |
| 4              | 76.2                            | 2.4                 | 74.5                | 4.1                          | .840                             | .11                                              | .27                                                                 | .88                                                                 |
| 5              | 76.1                            | 2.3                 | 74.5                | 3.9                          | .840                             | .11                                              | .20                                                                 | .88                                                                 |
| 6              | 76.1                            | 2.1                 | 74.6                | 3.6                          | .843                             | .12                                              | .13                                                                 | .89                                                                 |
| 7              | 76.5                            | 2.3                 | 74.9                | 3.9                          | .851                             | .21                                              | .23                                                                 | .88                                                                 |
| 8              | 77.6                            | 3.4                 | 75.2                | 5.8                          | .860                             | .24                                              | .90                                                                 | .83                                                                 |
| 9              | 78.7                            | 5.2                 | 75.1                | 8.8                          | .857                             | .17                                              | 2.96                                                                | .76                                                                 |
| 10             | 79.4                            | 7.2                 | 75.1                | 11.5                         | .857                             | .12                                              | 4.02                                                                | .69                                                                 |
| 11             | 79.9                            | 9.0                 | 74.5                | 14.4                         | .840                             | 8.92                                             | 5.12                                                                | .64                                                                 |
| Noon.          | 80.0                            | 10.8                | 73.5                | 17.3                         | .814                             | .60                                              | 6.24                                                                | .57                                                                 |
| 1              | 80.4                            | 11.8                | 73.3                | 18.9                         | .809                             | .50                                              | .95                                                                 | .55                                                                 |
| 2              | 80.6                            | 12.4                | 73.2                | 19.8                         | .806                             | .46                                              | 7.35                                                                | .54                                                                 |
| 3              | 80.3                            | 12.4                | 72.9                | 19.8                         | .797                             | .38                                              | .30                                                                 | .53                                                                 |
| 4              | 79.8                            | 11.8                | 72.7                | 18.9                         | .792                             | .35                                              | 6.84                                                                | .55                                                                 |
| 5              | 79.1                            | 10.6                | 72.7                | 17.0                         | .792                             | .38                                              | 5.99                                                                | .58                                                                 |
| 6              | 78.7                            | 8.1                 | 73.8                | 13.0                         | .822                             | .75                                              | 4.46                                                                | .66                                                                 |
| 7              | 78.3                            | 6.2                 | 74.0                | 10.5                         | .827                             | .84                                              | 3.51                                                                | .72                                                                 |
| 8              | 77.7                            | 5.0                 | 74.2                | 8.5                          | .832                             | .93                                              | 2.79                                                                | .76                                                                 |
| 9              | 77.8                            | 4.0                 | 75.0                | 6.8                          | .854                             | 9.18                                             | .22                                                                 | .81                                                                 |
| 10             | 77.4                            | 3.7                 | 74.8                | 6.3                          | .849                             | .15                                              | .02                                                                 | .82                                                                 |
| 11             | 77.1                            | 3.3                 | 74.8                | 5.6                          | .849                             | .15                                              | 1.79                                                                | .84                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of April 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                                                                                                       |
|-------|-----------------------|---------------------------------|-----------------------|---------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                                                                                                  |
|       | °                     | Inches                          |                       | lb            | Miles           |                                                                                                                                                                                                  |
| 1     | 138.0                 | ...                             | S by W & S            | ...           | 199.0           | B to 2 A.M., $\nearrow$ to 4 A.M. B to 3 P.M., $\nearrow$ to 8 P.M. B to 11 P.M.                                                                                                                 |
| 2     | 137.8                 | ...                             | S & S by E            | ...           | 203.5           | B to 5 A.M., $\nearrow$ to 11 P.M.                                                                                                                                                               |
| 3     | 142.0                 | ...                             | S, S by W & SSW       | ...           | 260.5           | $\nearrow$ to 1 P.M., $\nearrow$ & $\nearrow$ to 11 P.M.                                                                                                                                         |
| 4     | 137.2                 | ...                             | S S W & S             | 1.9           | 271.7           | $\nearrow$ to 5 A.M., $\nearrow$ to 11 A.M., $\nearrow$ to 4 P.M., $\nearrow$ to 11 P.M.                                                                                                         |
| 5     | 120.0                 | ...                             | S S W & S             | 2.5           | 287.4           | O to 5 A.M. S to 7 P.M. O to 11 P.M.                                                                                                                                                             |
| 6     | 129.0                 | ...                             | S & S S W             | ...           | 179.2           | O to 10 A.M. S to 6 P.M., $\nearrow$ to 11 P.M.                                                                                                                                                  |
| 7     | 122.0                 | ...                             | S by E & S            | 0.6           | 88.5            | Chiefly O.                                                                                                                                                                                       |
| 8     | 143.0                 | ...                             | S S W & S by E        | ...           | 123.8           | $\nearrow$ to 8 A.M. O to 12 A.M., $\nearrow$ to 7 P.M. B to 11 P.M.                                                                                                                             |
| 9     | 140.4                 | ...                             | S by E, S by W & S    | ...           | 157.8           | B to 6 A.M., $\nearrow$ to 10 A.M. B to 12 A.M., $\nearrow$ & $\nearrow$ to 4 P.M., $\nearrow$ to 7 P.M. B to 11 P.M.                                                                            |
| 10    | 143.5                 | ...                             | S S W & S W           | ...           | 232.3           | B.                                                                                                                                                                                               |
| 11    | 149.5                 | ...                             | S W & S S W           | 0.4           | 262.1           | B.                                                                                                                                                                                               |
| 12    | 151.5                 | ...                             | S S W & S W           | 0.2           | 245.2           | B.                                                                                                                                                                                               |
| 13    | 149.0                 | ...                             | S W & S S W           | 1.5           | 154.2           | Chiefly B.                                                                                                                                                                                       |
| 14    | 145.7                 | ...                             | S S W & S by W        | 0.2           | 221.0           | Sends to 9 A.M. B to 9 P.M. Sends to 11 P.M.                                                                                                                                                     |
| 15    | 145.3                 | ...                             | S S W                 | 0.2           | 220.1           | Sends to 8 A.M. B to 1 P.M., $\nearrow$ to 4 P.M. B to 8 P.M., $\nearrow$ to 11 P.M.                                                                                                             |
| 16    | 142.8                 | ...                             | S S W & S             | ...           | 200.7           | $\nearrow$ to 10 A.M. B to 11 P.M.                                                                                                                                                               |
| 17    | 144.0                 | ...                             | S W & S               | 1.3           | 200.3           | Chiefly B.                                                                                                                                                                                       |
| 18    | 143.6                 | ...                             | S S W & S             | 3.3           | 258.3           | Chiefly $\nearrow$ Brisk wind from 11 A.M. to 11 P.M. Lat 10 & 11 P.M. D at 10 P.M.                                                                                                              |
| 19    | 115.2                 | 0.20                            | S E & S S W           | 9.2           | 322.4           | $\nearrow$ & $\nearrow$ to 6 A.M. O to 3 P.M. $\nearrow$ to 7 P.M., S to 11 P.M. High wind from 6½ to 7½ A.M. L at midnight and from 9 to 11 P.M. T at 6½ and 7½ A.M. Slight R from 6½ to 9 A.M. |
| 20    | 113.8                 | 1.02                            | S S E & Variable.     | 0.8           | 135.8           | S to 7 A.M., O and $\nearrow$ to 11 P.M. T and R from 11 A.M. to 4 P.M.                                                                                                                          |

$\nearrow$  i Cirri, — i Strati,  $\nearrow$  i Cumuli,  $\nearrow$  i Cirro-strati,  $\nearrow$  i Cumulo-strati,  $\nearrow$  i Nimb,  $\nearrow$  i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of April 1873.*

Solar Radiation. Weather. &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | Wind.                 |                |                 | General aspect of the Sky.                                                                                                                                                                       |
|-------|-----------------------|---------------------------------|-----------------------|----------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure. | Daily Velocity. |                                                                                                                                                                                                  |
|       | °                     | Inches                          |                       | lb             | Mile.           |                                                                                                                                                                                                  |
| 21    | 132.0                 | 0.15                            | N E & Variable.       | 0.5            | 185.7           | Λ i to 1 A. M., O to 9 A. M., Λ i to 5 P. M., B to 11 P. M. T at 3 A. M. I at 2 and 3 A. M. Slight R from 2 to 5 and at 8 A. M.                                                                  |
| 22    | 137.0                 | ...                             | S                     | 0.9            | 146.5           | Chiefly B.                                                                                                                                                                                       |
| 23    | 139.0                 | ...                             | S S W & S             | 3.0            | 300.0           | B to 7 A. M., Scuds and Λ i to 1 P. M. B to 11 P. M. Brisk wind from 8 to 11½ A. M., I on Nat 8 P. M. D between 9 and 10 P. M.                                                                   |
| 24    | 140.2                 | ...                             | S E & S               | 1.0            | 252.5           | B to 7 A. M., Λ i to 2 P. M., clouds of different kind to 11 P. M. I on N E between 7 and 8 P. M.                                                                                                |
| 25    | 141.0                 | ...                             | S by E & S by W       | 2.0            | 297.0           | Clouds of different kinds. Brisk wind from 3¼ to 6¼ P. M. L between 8 and 9 P. M.                                                                                                                |
| 26    | 145.5                 | ...                             | S by E & S            | 2.3            | 275.5           | Scuds to 4 A. M., Λ i to 8 A. M., B to 3 P. M., Λ i to 11 P. M. Brisk wind from 1½ to 8 P. M.                                                                                                    |
| 27    | 142.0                 | ...                             | S S E. S & S by E     | 1.7            | 298.5           | Scuds to 9 A. M., B to 11 P. M. Brisk wind from 2¼ to 6 P. M., T at 6 P. M.                                                                                                                      |
| 28    | 148.0                 | 0.40                            | S & S by E            | 30.4           | 278.8           | Scuds to 3 A. M., Λ i to 8 A. M. Λ i to 4 P. M., O to 11 P. M. Violent storm from 5¼ to 6¼ P. M. T at 5, 6, 10 and 11 P. M. L from 6 to 11 P. M., R at 6 and between 10 and 11 P. M.             |
| 29    | 133.8                 | 0.07                            | E                     | 3.5            | 273.3           | O to 12 A. M., clouds of different kind to 11 P. M. High wind from 9¼ to 10¼ A. M., T at midnight, 1, 10½ A. M., and 2½ P. M. L at midnight. Slight R between midnight and 1 and 10 and 11 A. M. |
| 30    | 142.7                 |                                 | S S E & E by S        | 2.9            | 151.3           | B to 4 A. M., S to 8 A. M., Λ i to 4 P. M., S to 9 P. M., B to 11 P. M. Brisk wind between 4½ and 5½ P. M., T from 4 to 6 P. M., D at 2½ and 4½ P. M.                                            |

Λ i Cirri, — i Strati, Λ i Cumuli, Λ i Cirro-strati, Λ i Cumulo-strati, Λ i Nimbi, Λ i Cirro-cumuli, B clear, S strati, O overcast, T thunder, L lightning R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surgeon General's Office, Calcutta,  
in the month of April 1873.*

MONTHLY RESULTS.

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|                                                                  |     |     |         |
|------------------------------------------------------------------|-----|-----|---------|
|                                                                  |     |     | Inches. |
| Mean height of the Barometer for the month                       | ... | ... | 29.733  |
| Max. height of the Barometer occurred at 8 A. M. on the 10th     | ... | ... | 29.974  |
| Min. height of the Barometer occurred at 5 & 6 P. M. on the 12th | ... | ... | 29.494  |
| Extreme range of the Barometer during the month                  | ... | ... | 0.480   |
| Mean of the daily Max. Pressures                                 | ... | ... | 29.809  |
| Ditto ditto Min. ditto                                           | ... | ... | 29.658  |
| Mean daily range of the Barometer during the month               | ... | ... | 0.151   |

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|                                                      |     |     |       |
|------------------------------------------------------|-----|-----|-------|
|                                                      |     |     | °     |
| Mean Dry Bulb Thermometer for the month              | ... | ... | 84.2  |
| Max. Temperature occurred at 4 P. M. on the 12th     | ... | ... | 103.5 |
| Min. Temperature occurred at 5 & 6 A. M. on the 21st | ... | ... | 71.0  |
| Extreme range of the Temperature during the month    | ... | ... | 32.5  |
| Mean of the daily Max. Temperature                   | ... | ... | 93.8  |
| Ditto ditto Min. ditto                               | ... | ... | 77.3  |
| Mean daily range of the Temperature during the month | ... | ... | 16.5  |

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|                                                           |     |     |      |
|-----------------------------------------------------------|-----|-----|------|
| Mean Wet Bulb Thermometer for the month                   | ... | ... | 78.1 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer | ... | ... | 6.1  |
| Computed Mean Dew-point for the month                     | ... | ... | 73.8 |
| Mean Dry Bulb Thermometer above computed mean Dew-point   | ... | ... | 10.4 |

|                                            |     |     |         |
|--------------------------------------------|-----|-----|---------|
|                                            |     |     | Inches. |
| Mean Elastic force of Vapour for the month | ... | ... | 0.822   |

---

|                                                                        |     |     |             |
|------------------------------------------------------------------------|-----|-----|-------------|
|                                                                        |     |     | Troy grain. |
| Mean Weight of Vapour for the month                                    | ... | ... | 8.80        |
| Additional Weight of Vapour required for complete saturation           | ... | ... | 3.44        |
| Mean degree of humidity for the month, complete saturation being unity | ... | ... | 0.72        |

|                                                     |     |     |       |
|-----------------------------------------------------|-----|-----|-------|
|                                                     |     |     | °     |
| Mean Max. Solar radiation Thermometer for the month | ... | ... | 138.3 |

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|                                                                                               |     |              |         |
|-----------------------------------------------------------------------------------------------|-----|--------------|---------|
|                                                                                               |     |              | Inches. |
| Rained 8 days.—Max. fall of rain during 24 hours                                              | ... | ...          | 1.02    |
| Total amount of rain during the month                                                         | ... | ...          | 1.84    |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month | ... | ...          | 1.58    |
| Prevailing direction of the Wind                                                              | ... | S. S. W & S. |         |

\* Height 70 feet 10 inches above ground.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of May 1873.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at 32° Fahr. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|-------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                 | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                         | Inches.                                   | Inches. | Inches. | °                             | °                                             | °    | °     |
| 1     | 29.662                                          | 29.737                                    | 29.553  | 0.184   | 82.7                          | 93.0                                          | 75.5 | 17.5  |
| 2     | .644                                            | .697                                      | .579    | .118    | 83.7                          | 92.4                                          | 76.0 | 16.4  |
| 3     | .668                                            | .735                                      | .579    | .156    | 81.0                          | 94.7                                          | 72.2 | 22.5  |
| 4     | .771                                            | .843                                      | .723    | .110    | 75.6                          | 90.5                                          | 71.0 | 19.5  |
| 5     | .839                                            | .927                                      | .770    | .157    | 79.1                          | 88.0                                          | 71.0 | 17.0  |
| 6     | .864                                            | .933                                      | .785    | .148    | 79.6                          | 88.7                                          | 71.0 | 17.7  |
| 7     | .842                                            | .918                                      | .776    | .142    | 83.4                          | 92.0                                          | 75.3 | 16.7  |
| 8     | .816                                            | .900                                      | .731    | .169    | 85.5                          | 94.0                                          | 80.1 | 13.9  |
| 9     | .818                                            | .880                                      | .755    | .125    | 86.5                          | 98.0                                          | 80.0 | 16.0  |
| 10    | .814                                            | .884                                      | .738    | .146    | 87.6                          | 97.3                                          | 80.0 | 17.3  |
| 11    | .727                                            | .805                                      | .649    | .156    | 88.7                          | 99.5                                          | 80.0 | 19.5  |
| 12    | .682                                            | .752                                      | .602    | .150    | 88.8                          | 100.1                                         | 81.5 | 18.6  |
| 13    | .730                                            | .798                                      | .660    | .138    | 87.2                          | 94.8                                          | 80.4 | 14.4  |
| 14    | .744                                            | .810                                      | .689    | .121    | 89.3                          | 100.2                                         | 80.5 | 19.7  |
| 15    | .742                                            | .818                                      | .669    | .149    | 89.9                          | 100.0                                         | 81.8 | 18.2  |
| 16    | .734                                            | .810                                      | .656    | .154    | 90.3                          | 100.5                                         | 82.0 | 18.5  |
| 17    | .698                                            | .769                                      | .651    | .118    | 91.1                          | 101.7                                         | 82.6 | 19.1  |
| 18    | .697                                            | .756                                      | .650    | .106    | 91.4                          | 103.0                                         | 83.2 | 19.8  |
| 19    | .687                                            | .756                                      | .613    | .143    | 92.0                          | 104.2                                         | 83.0 | 21.2  |
| 20    | .669                                            | .734                                      | .607    | .127    | 92.1                          | 104.5                                         | 83.3 | 21.2  |
| 21    | .627                                            | .691                                      | .543    | .148    | 92.3                          | 106.0                                         | 83.5 | 22.5  |
| 22    | .592                                            | .651                                      | .514    | .137    | 91.4                          | 104.0                                         | 83.2 | 20.8  |
| 23    | .574                                            | .650                                      | .495    | .155    | 89.8                          | 99.0                                          | 82.0 | 17.0  |
| 24    | .646                                            | .702                                      | .583    | .119    | 87.3                          | 97.0                                          | 76.5 | 20.5  |
| 25    | .676                                            | .731                                      | .584    | .147    | 86.6                          | 98.8                                          | 77.0 | 21.8  |
| 26    | .666                                            | .725                                      | .589    | .136    | 87.5                          | 96.5                                          | 79.0 | 17.5  |
| 27    | .677                                            | .751                                      | .610    | .141    | 83.7                          | 91.5                                          | 79.4 | 12.1  |
| 28    | .608                                            | .673                                      | .537    | .136    | 82.4                          | 88.5                                          | 78.9 | 9.6   |
| 29    | .524                                            | .589                                      | .430    | .159    | 81.4                          | 91.5                                          | 79.5 | 12.0  |
| 30    | .467                                            | .515                                      | .392    | .123    | 84.3                          | 91.3                                          | 80.0 | 11.3  |
| 31    | .442                                            | .505                                      | .374    | .131    | 86.0                          | 93.7                                          | 81.3 | 12.4  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of May 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 78.4                            | 4.3                 | 75.4                | 7.3                          | 0.865                            | 9.30                                             | 2.42                                                                | 0.79                                                                |
| 2     | 79.4                            | 4.3                 | 76.4                | 7.3                          | .893                             | .58                                              | .40                                                                 | .79                                                                 |
| 3     | 79.2                            | 4.8                 | 75.8                | 8.2                          | .876                             | .90                                              | .78                                                                 | .77                                                                 |
| 4     | 72.9                            | 2.7                 | 71.0                | 4.6                          | .751                             | 8.17                                             | 1.31                                                                | .86                                                                 |
| 5     | 74.5                            | 4.6                 | 71.3                | 7.8                          | .758                             | .20                                              | 2.33                                                                | .78                                                                 |
| 6     | 74.3                            | 5.3                 | 70.6                | 9.0                          | .741                             | .00                                              | .69                                                                 | .75                                                                 |
| 7     | 76.7                            | 6.7                 | 72.0                | 11.4                         | .776                             | .31                                              | 3.65                                                                | .70                                                                 |
| 8     | 79.4                            | 6.1                 | 75.1                | 10.4                         | .857                             | 9.15                                             | .57                                                                 | .72                                                                 |
| 9     | 79.7                            | 6.8                 | 75.6                | 10.9                         | .871                             | .27                                              | .83                                                                 | .71                                                                 |
| 10    | 80.7                            | 6.9                 | 76.6                | 11.0                         | .899                             | .56                                              | .96                                                                 | .71                                                                 |
| 11    | 80.0                            | 8.7                 | 74.8                | 13.9                         | .849                             | .00                                              | 4.06                                                                | .65                                                                 |
| 12    | 80.0                            | 8.8                 | 74.7                | 14.1                         | .846                             | 8.97                                             | 5.03                                                                | .64                                                                 |
| 13    | 77.4                            | 9.8                 | 71.5                | 15.7                         | .763                             | .11                                              | .26                                                                 | .61                                                                 |
| 14    | 80.1                            | 9.2                 | 74.6                | 14.7                         | .843                             | .92                                              | .29                                                                 | .63                                                                 |
| 15    | 82.0                            | 7.9                 | 77.3                | 12.6                         | .919                             | 9.72                                             | 4.74                                                                | .67                                                                 |
| 16    | 80.9                            | 9.4                 | 75.3                | 15.0                         | .862                             | .12                                              | 5.51                                                                | .62                                                                 |
| 17    | 79.1                            | 12.0                | 71.9                | 19.2                         | .773                             | 8.16                                             | 6.31                                                                | .55                                                                 |
| 18    | 79.2                            | 12.2                | 71.9                | 19.5                         | .773                             | .14                                              | .96                                                                 | .54                                                                 |
| 19    | 81.1                            | 10.9                | 74.6                | 17.4                         | .843                             | .89                                              | .47                                                                 | .58                                                                 |
| 20    | 81.7                            | 10.4                | 75.5                | 16.6                         | .868                             | 9.14                                             | .27                                                                 | .59                                                                 |
| 21    | 82.3                            | 10.0                | 76.3                | 16.0                         | .890                             | .38                                              | .12                                                                 | .60                                                                 |
| 22    | 83.6                            | 7.8                 | 78.9                | 12.5                         | .967                             | 10.20                                            | 4.90                                                                | .68                                                                 |
| 23    | 82.2                            | 7.6                 | 77.6                | 12.2                         | .928                             | 9.83                                             | .59                                                                 | .68                                                                 |
| 24    | 78.9                            | 8.4                 | 73.9                | 13.4                         | .824                             | 8.78                                             | .63                                                                 | .66                                                                 |
| 25    | 78.2                            | 8.4                 | 73.2                | 13.4                         | .806                             | .59                                              | .55                                                                 | .65                                                                 |
| 26    | 78.9                            | 8.6                 | 73.7                | 13.8                         | .819                             | .71                                              | .78                                                                 | .65                                                                 |
| 27    | 80.0                            | 3.7                 | 77.4                | 6.3                          | .922                             | 9.89                                             | 2.18                                                                | .82                                                                 |
| 28    | 78.8                            | 3.6                 | 76.3                | 6.1                          | .890                             | .57                                              | .04                                                                 | .82                                                                 |
| 29    | 79.5                            | 4.9                 | 76.1                | 8.3                          | .885                             | .48                                              | .83                                                                 | .77                                                                 |
| 30    | 79.7                            | 4.6                 | 76.5                | 7.8                          | .896                             | .59                                              | .69                                                                 | .78                                                                 |
| 31    | 80.3                            | 5.7                 | 76.3                | 9.7                          | .890                             | .50                                              | 3.41                                                                | .74                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of May 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour .<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|--------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                               | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                  | °    | °     |
| Mid-<br>night. | 29.701                                          | 29.933                                                       | 29.478  | 0.455   | 81.6                          | 86.5                                                               | 71.6 | 14.9  |
| 1              | .691                                            | .874                                                         | .468    | .406    | 81.3                          | 86.0                                                               | 71.3 | 14.7  |
| 2              | .680                                            | .854                                                         | .457    | .397    | 80.9                          | 85.3                                                               | 71.2 | 14.1  |
| 3              | .670                                            | .840                                                         | .446    | .394    | 80.6                          | 84.6                                                               | 71.0 | 13.6  |
| 4              | .671                                            | .824                                                         | .434    | .390    | 80.2                          | 83.8                                                               | 71.0 | 12.8  |
| 5              | .685                                            | .866                                                         | .445    | .421    | 80.1                          | 83.6                                                               | 71.0 | 12.6  |
| 6              | .699                                            | .864                                                         | .463    | .401    | 80.2                          | 83.5                                                               | 71.0 | 12.5  |
| 7              | .720                                            | .883                                                         | .479    | .404    | 81.4                          | 85.2                                                               | 72.0 | 13.2  |
| 8              | .737                                            | .912                                                         | .496    | .416    | 84.2                          | 88.5                                                               | 76.7 | 11.8  |
| 9              | .748                                            | .918                                                         | .505    | .413    | 87.4                          | 92.0                                                               | 79.7 | 12.3  |
| 10             | .748                                            | .917                                                         | .491    | .426    | 90.2                          | 95.6                                                               | 82.4 | 13.2  |
| 11             | .740                                            | .927                                                         | .478    | .449    | 91.8                          | 98.6                                                               | 84.0 | 14.6  |
| Neon.          | .720                                            | .916                                                         | .452    | .464    | 93.2                          | 101.2                                                              | 79.4 | 21.8  |
| 1              | .701                                            | .893                                                         | .431    | .462    | 94.2                          | 104.0                                                              | 74.0 | 30.0  |
| 2              | .674                                            | .866                                                         | .405    | .461    | 94.9                          | 104.5                                                              | 71.0 | 33.5  |
| 3              | .651                                            | .835                                                         | .386    | .449    | 95.3                          | 106.0                                                              | 71.6 | 34.4  |
| 4              | .631                                            | .809                                                         | .374    | .435    | 94.8                          | 106.0                                                              | 71.5 | 34.5  |
| 5              | .620                                            | .796                                                         | .392    | .404    | 93.3                          | 103.9                                                              | 71.0 | 32.9  |
| 6              | .632                                            | .788                                                         | .394    | .394    | 90.3                          | 100.7                                                              | 71.0 | 29.7  |
| 7              | .617                                            | .807                                                         | .407    | .400    | 87.3                          | 96.0                                                               | 71.0 | 25.0  |
| 8              | .671                                            | .832                                                         | .418    | .414    | 85.6                          | 92.0                                                               | 71.0 | 21.0  |
| 9              | .688                                            | .860                                                         | .423    | .437    | 84.2                          | 89.8                                                               | 72.0 | 17.8  |
| 10             | .699                                            | .900                                                         | .444    | .456    | 82.8                          | 87.6                                                               | 72.1 | 15.5  |
| 11             | .701                                            | .927                                                         | .440    | .487    | 82.3                          | 86.8                                                               | 71.0 | 15.8  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb  
Thermometer Means are derived from the observations made at the several  
hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of May 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 78.5                            | 3.1                 | 76.3                | 5.3                          | 0.890                            | 9.59                                             | 1.75                                                                | 0.85                                                                |
| 1              | 78.5                            | 2.8                 | 76.5                | 4.8                          | .896                             | .65                                              | .59                                                                 | .86                                                                 |
| 2              | 78.2                            | 2.7                 | 76.3                | 4.6                          | .890                             | .59                                              | .51                                                                 | .86                                                                 |
| 3              | 78.0                            | 2.6                 | 76.2                | 4.4                          | .887                             | .58                                              | .43                                                                 | .87                                                                 |
| 4              | 77.9                            | 2.3                 | 76.3                | 3.9                          | .890                             | .61                                              | .27                                                                 | .88                                                                 |
| 5              | 77.9                            | 2.2                 | 76.4                | 3.7                          | .893                             | .64                                              | .20                                                                 | .89                                                                 |
| 6              | 78.1                            | 2.1                 | 76.6                | 3.6                          | .899                             | .69                                              | .19                                                                 | .89                                                                 |
| 7              | 78.8                            | 2.6                 | 77.0                | 4.4                          | .910                             | .81                                              | .46                                                                 | .87                                                                 |
| 8              | 79.7                            | 4.5                 | 76.5                | 7.7                          | .896                             | .59                                              | 2.65                                                                | .78                                                                 |
| 9              | 80.6                            | 6.8                 | 76.5                | 10.9                         | .896                             | .54                                              | 3.91                                                                | .71                                                                 |
| 10             | 81.0                            | 9.2                 | 75.5                | 14.7                         | .868                             | .18                                              | 5.41                                                                | .63                                                                 |
| 11             | 81.0                            | 10.8                | 74.5                | 17.3                         | .840                             | 8.87                                             | 6.40                                                                | .58                                                                 |
| Noon.          | 80.7                            | 12.5                | 73.2                | 20.0                         | .806                             | .47                                              | 7.43                                                                | .53                                                                 |
| 1              | 79.9                            | 14.3                | 71.3                | 22.9                         | .758                             | 7.95                                             | 8.41                                                                | .49                                                                 |
| 2              | 79.4                            | 15.5                | 70.1                | 24.8                         | .720                             | .64                                              | 9.05                                                                | .46                                                                 |
| 3              | 79.9                            | 15.4                | 70.7                | 24.6                         | .744                             | .78                                              | .11                                                                 | .46                                                                 |
| 4              | 79.6                            | 15.2                | 70.5                | 24.3                         | .739                             | .74                                              | 8.91                                                                | .47                                                                 |
| 5              | 80.4                            | 12.9                | 72.7                | 20.6                         | .792                             | 8.32                                             | 7.63                                                                | .52                                                                 |
| 6              | 80.1                            | 10.2                | 74.0                | 16.3                         | .827                             | .75                                              | 5.88                                                                | .60                                                                 |
| 7              | 79.9                            | 7.4                 | 75.5                | 11.8                         | .868                             | 9.23                                             | 4.18                                                                | .69                                                                 |
| 8              | 79.6                            | 6.0                 | 75.4                | 10.2                         | .865                             | .24                                              | 3.52                                                                | .72                                                                 |
| 9              | 78.7                            | 5.5                 | 74.8                | 9.4                          | .849                             | .09                                              | .15                                                                 | .74                                                                 |
| 10             | 78.9                            | 3.9                 | 76.2                | 6.6                          | .887                             | .52                                              | 2.23                                                                | .81                                                                 |
| 11             | 78.7                            | 3.6                 | 76.2                | 6.1                          | .887                             | .54                                              | .04                                                                 | .82                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of May 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |                |                 | General aspect of the Sky.                                                                                                                                                                             |
|-------|-----------------------|---------------------------------|-----------------------|----------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure. | Daily Velocity. |                                                                                                                                                                                                        |
|       | °                     | Inches                          |                       | lb             | Miles           |                                                                                                                                                                                                        |
| 1     | 140.8                 | 0.35                            | S by W, S & S E       | 9.6            | 175.0           | S to 3 A. M., B to 7 A. M., ~i to 1 P. M., ~i to 4 P. M., ~i to 7 P. M., B to 17 P. M. High wind from 4½ to 6½ P. M. T at 6 P. M. R. between 5 & 6 P. M.                                               |
| 2     | 142.5                 | ...                             | S E & S               | 0.4            | 246.6           | B to 4 A. M., ~i to 9 A. M., ~i to 12 A. M., ~i to 3 P. M., S to 9 P. M. B to 11 P. M. T at 5 P. M., L from 7½ to 9 P. M.                                                                              |
| 3     | 143.0                 | 0.66                            | S S W & S             | 10.3           | 250.6           | S to 7 A. M., ~i to 5 P. M., O to 8 P. M., S to 11 P. M. High wind from 6 to 6½ P. M., T from 5½ to 7 P. M., L from 6 to 10 P. M. R between 5 & 6 and at 8 P. M.                                       |
| 4     | 137.0                 | 0.94                            | Variable              | 25.0           | 222.6           | B to 4 A. M., clouds of different kinds to 9 A. M., ~i to 12 A. M., O to 11 P. M. Storm from 12½ A. M. to 1½ P. M. High wind between 10 & 11 P. M. T & L from 1 to 11 P. M. R from 1 to 6 & at 8 P. M. |
| 5     | 136.0                 | 0.60                            | Variable              | 5.2            | 228.2           | O to 7 A. M., ~i to 11 A. M., ~i to 8 P. M., O to 11 P. M. High wind from 9 to 10½ P. M. L from 7 to 11 P. M. T & R between 9½ to 11 P. M.                                                             |
| 6     | 134.8                 | 0.27                            | Variable              | ...            | 165.3           | O to 3 A. M., ~i to 7 A. M., ~i to 11 A. M., ~i to 6 P. M., B to 11 P. M. L at midnight & 1 A. M. Slight R from midnight to 2 A. M.                                                                    |
| 7     | 138.8                 | ...                             | S W & W S W           | ...            | 107.0           | S to 3 A. M., ~i to 7 A. M., ~i to 11 A. M. B to 11 P. M.                                                                                                                                              |
| 8     | 142.0                 | ...                             | S W & S               | ...            | 126.3           | ~i to 7 A. M., ~i to 1 P. M. ~i to 3 P. M. B to 6 P. M., ~i to 11 P. M.                                                                                                                                |
| 9     | 139.0                 | ...                             | S & S W               | ...            | 164.6           | B to 4 A. M., ~i to 6 A. M. B to 1 P. M., ~i to 11 P. M.                                                                                                                                               |

~i Cirri,—i Strati, ~i Cumuli, ~i Cirro-strati, ~i Cumulo-strati, ~i Nimib,  
~i Cirro-cumuli, B clear, S stratonii, O overcast, T thunder, L lightning,  
R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of May 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge<br>1½ ft. above<br>Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                                                                           |
|-------|-----------------------|---------------------------------------|-----------------------|---------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                       | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                                                                      |
|       | °                     | Inches                                |                       | h             | Mile.           |                                                                                                                                                                      |
| 10    | 143.0                 | ...                                   | S W & W S W           | ...           | 191.0           | B to 4 A. M., \i to 6 A. M.,<br>\i to 9 P. M., \i to 11 P. M.                                                                                                        |
| 11    | 145.8                 | ...                                   | S W & Variable        | ...           | 166.8           | \i to 6 A. M. B to 1 P. M., \i<br>& \i to 6 P. M. B to 9 P. M., \i<br>to 11 P. M.                                                                                    |
| 12    | 146.0                 | ...                                   | S & Variable          | 2.8           | 175.6           | \i to 11 A. M., \i to 2 P. M.,<br>\i to 5 P. M. O to 8 P. M., \i to<br>11 P. M. Brisk wind between 7<br>& 7½ P. M. T & L from 6½ to 8<br>P. M. D between 7 & 8 P. M. |
| 13    | 146.0                 | ...                                   | W N W & Variable      | ...           | 153.9           | \i & \i to 4 A. M. S to 7 A.<br>M., \i to 8 P. M. B to 11 P. M.                                                                                                      |
| 14    | 147.5                 | ...                                   | W S W                 | ...           | 152.1           | \i to 4 A. M. B to 12 A. M., \i<br>to 6 P. M., \i to 11 P. M.                                                                                                        |
| 15    | 144.2                 | ...                                   | S & S W               | ...           | 159.6           | B to 2 P. M., \i to 8 P. M. B<br>11 P. M. T at 5 P. M. L on N at<br>S. P. M.                                                                                         |
| 16    | 143.7                 | ...                                   | S W & Variable        | ...           | 145.1           | \i to 8 A. M. B to 11 P. M.                                                                                                                                          |
| 17    | 148.3                 | ...                                   | Variable              | 0.2           | 129.6           | B to 6 A. M., \i to 9 A. M.<br>B to 11 P. M.                                                                                                                         |
| 18    | 146.5                 | ...                                   | W by N                | ...           | 124.0           | B.                                                                                                                                                                   |
| 19    | 151.2                 | ...                                   | S W & W by S          | ...           | 139.9           | B.                                                                                                                                                                   |
| 20    | 150.5                 | ...                                   | W & S S W             | ...           | 138.9           | S to 1 A. M. B to 11 P. M.                                                                                                                                           |
| 21    | 150.0                 | ...                                   | S W & W S W           | ...           | 182.7           | B.                                                                                                                                                                   |
| 22    | 150.2                 | ...                                   | S W & S               | ...           | 207.0           | Chiefly B.                                                                                                                                                           |
| 23    | 142.7                 | ...                                   | S S W                 | 2.0           | 306.0           | B to 7 P. M., clouds of different<br>kinds to 11 P. M. Brisk wind<br>from 12½ A. M. to 5½ & 11 to 11½<br>P. M. L from 8½ to 10 P. M.                                 |
| 24    | 143.0                 | ...                                   | S S W & S by E        | 11.0          | 401.3           | O to 2 A. M., \i to 8 A. M.,<br>Scuds to 11 A. M., \i to 8 P. M.<br>O to 11 P. M. Strong wind from<br>11½ to 12 P. M. L from 8 to 11<br>P. M. Dat 8½ P. M.           |

\i Cirri,—i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i Nimbi,  
\i Cirro-cumuli, B clear, S straton, O overcast, T thunder, L lightning  
R. rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of May 1873.*

Solar Radiation, Weather, &c.,

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                                                                                                         |
|-------|-----------------------|---------------------------------|-----------------------|---------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                                                                                                    |
| 25    | 145.0                 | ...                             | Variable              | 4.0           | 239.2           | O to 2 A. M., B to 4 A. M., $\wedge$ i to 10 A. M., $\wedge$ i to 4 P. M., $\wedge$ i to 8 P. M. S to 11 P. M. Brisk wind from midnight to 0½ A. M. L at midnight & 1 A. M. and from 8 to 11 P. M. |
| 26    | 144.7                 | ...                             | S S W                 | 1.0           | 280.4           | O to 5 A. M., $\wedge$ i to 8 A. M., $\wedge$ i to 6 P. M. B to 11 P. M. T at 4 P. M. L from midnight to 2 A. M. Dat 12¾ A. M. & 4½ P. M.                                                          |
| 27    | 106.0                 | 0.82                            | S by W & S            | 5.0           | 182.4           | B to 6 A. M., $\wedge$ i to 10 A. M. O to 2 P. M. S to 4 P. M., $\wedge$ i to 6 P. M. B to 11 P. M. High wind from 11 to 11½ A. M. T from 10½ A. M. to 1 P. M. R at 8 and from 11 to 12½ A. M.     |
| 28    | 136.5                 | 0.06                            | S & S by W            | 1.4           | 124.0           | B to 3 A. M., clouds of different kinds to 11 P. M. T at 12 A. M. & 3½ P. M. L between 7 & 8 P. M. Slight R at 12 A. M. and 3¾ P. M.                                                               |
| 29    | 140.0                 | ...                             | S by W & E N E        | 0.2           | 133.8           | S to 5 A. M., $\wedge$ i to 7 A. M., $\wedge$ i to 2 P. M., $\wedge$ i to 7 P. M. S to 11 P. M.                                                                                                    |
| 30    | 140.5                 | 0.03                            | E N E & N E           | 0.4           | 154.0           | O to 7 A. M., $\wedge$ i & $\wedge$ i to 7 P. M., $\wedge$ i to 9 P. M. B to 11 P. M. Light R at 10½ A. M. & 1½ P. M.                                                                              |
| 31    | 141.7                 | 0.05                            | N E & E by N          | 1.2           | 218.2           | S to 6 A. M., $\wedge$ i to 4 P. M., clouds of different kinds to 11 P. M. Slight R at 5 P. M.                                                                                                     |

$\wedge$  i Cirri — i Strati,  $\wedge$  i Cumuli,  $\wedge$  i Cirro-strati,  $\wedge$  i Cumulo-strati  $\wedge$  i Nimbi,  $\wedge$  i Cirro-Cumuli, B clear, S strati, O overcast, T thunder, L lightning, R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of May 1873.*

MONTHLY RESULTS.

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|                                                                  | Inches. |
|------------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..                | 29.689  |
| Max. height of the Barometer occurred at Midnight on the 6th ... | 29.933  |
| Min. height of the Barometer occurred at 4 p. m. on the 31st ... | 29.374  |
| Extreme range of the Barometer during the month ... ..           | 0.559   |
| Mean of the daily Max. Pressures ... ..                          | 29.756  |
| Ditto ditto Min. ditto ... ..                                    | 29.616  |
| Mean daily range of the Barometer during the month ... ..        | 0.140   |

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|                                                             | °     |
|-------------------------------------------------------------|-------|
| Mean Dry Bulb Thermometer for the month ... ..              | 86.6  |
| Max. Temperature occurred at 3 & 4 p. m. on the 21st ... .. | 106.0 |
| Min. Temperature occurred at 6 a. m. on the 5th ... ..      | 71.0  |
| Extreme range of the Temperature during the month ... ..    | 35.0  |
| Mean of the daily Max. Temperature ... ..                   | 96.6  |
| Ditto ditto Min. ditto, ... ..                              | 79.5  |
| Mean daily range of the Temperature during the month ... .. | 17.4  |

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|                                                               |      |
|---------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..                | 79.3 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ... | 7.3  |
| Computed Mean Dew-point for the month ... ..                  | 74.9 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ...   | 11.7 |

|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.851   |

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|                                                                        | Troy grain. |
|------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                             | 9.06        |
| Additional Weight of Vapour required for complete saturation ...       | 4.08        |
| Mean degree of humidity for the month, complete saturation being unity | 0.69        |

|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 142.2 |

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|                                                                                                      | Inches. |
|------------------------------------------------------------------------------------------------------|---------|
| Rained 12 days,—Max. fall of rain during 24 hours* ... ..                                            | 0.94    |
| Total amount of rain during the month ... ..                                                         | 3.78    |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month ... .. | 3.28    |
| Prevailing direction of the Wind ... .. S. W & S. S. W.                                              |         |

\* Height 70 feet 10 inches above ground.

*Abstract of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of May 1873.*

### MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

[illegible]





*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of June 1873.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at 32° Falt. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|-------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                 | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                         | Inches.                                   | Inches. | Inches. | o                             | o                                             | o    | o     |
| 1     | 29.407                                          | 29.455                                    | 29.325  | 0.130   | 87.6                          | 99.0                                          | 82.5 | 16.5  |
| 2     | .412                                            | .471                                      | .327    | .144    | 91.4                          | 103.0                                         | 81.0 | 19.0  |
| 3     | .506                                            | .592                                      | .456    | .136    | 88.3                          | 95.2                                          | 86.0 | 9.2   |
| 4     | .577                                            | .661                                      | .522    | .139    | 88.4                          | 94.2                                          | 83.0 | 11.2  |
| 5     | .619                                            | .672                                      | .558    | .114    | 89.3                          | 96.4                                          | 84.5 | 11.9  |
| 6     | .617                                            | .682                                      | .529    | .153    | 89.1                          | 96.5                                          | 82.0 | 14.5  |
| 7     | .583                                            | .649                                      | .509    | .140    | 88.1                          | 95.0                                          | 82.6 | 12.4  |
| 8     | .556                                            | .602                                      | .500    | .102    | 88.1                          | 95.6                                          | 82.0 | 13.6  |
| 9     | .561                                            | .603                                      | .499    | .104    | 88.5                          | 96.2                                          | 82.0 | 14.2  |
| 10    | .554                                            | .602                                      | .467    | .135    | 89.1                          | 97.0                                          | 82.0 | 15.0  |
| 11    | .478                                            | .537                                      | .399    | .138    | 88.4                          | 95.4                                          | 83.0 | 12.4  |
| 12    | .415                                            | .477                                      | .326    | .151    | 89.0                          | 98.7                                          | 83.5 | 15.2  |
| 13    | .424                                            | .494                                      | .370    | .124    | 85.9                          | 98.7                                          | 78.0 | 20.7  |
| 14    | .462                                            | .511                                      | .391    | .120    | 83.6                          | 92.9                                          | 78.5 | 14.4  |
| 15    | .451                                            | .495                                      | .393    | .102    | 85.4                          | 91.5                                          | 81.2 | 10.3  |
| 16    | .487                                            | .533                                      | .432    | .101    | 80.8                          | 83.5                                          | 78.5 | 5.0   |
| 17    | .505                                            | .548                                      | .451    | .097    | 83.2                          | 90.7                                          | 79.0 | 11.7  |
| 18    | .476                                            | .521                                      | .411    | .110    | 85.1                          | 92.7                                          | 78.8 | 13.9  |
| 19    | .490                                            | .531                                      | .442    | .089    | 86.3                          | 93.0                                          | 80.0 | 13.0  |
| 20    | .491                                            | .531                                      | .435    | .096    | 88.8                          | 96.2                                          | 83.3 | 12.9  |
| 21    | .491                                            | .526                                      | .437    | .089    | 89.2                          | 96.8                                          | 83.5 | 13.3  |
| 22    | .486                                            | .542                                      | .426    | .116    | 88.8                          | 98.5                                          | 79.5 | 19.0  |
| 23    | .533                                            | .601                                      | .491    | .110    | 86.9                          | 95.5                                          | 79.8 | 15.7  |
| 24    | .542                                            | .601                                      | .488    | .113    | 89.1                          | 95.0                                          | 84.0 | 11.1  |
| 25    | .517                                            | .566                                      | .452    | .114    | 90.2                          | 98.5                                          | 84.2 | 14.3  |
| 26    | .472                                            | .518                                      | .409    | .109    | 92.1                          | 102.3                                         | 84.5 | 17.8  |
| 27    | .492                                            | .547                                      | .422    | .125    | 92.4                          | 102.8                                         | 85.3 | 17.5  |
| 28    | .537                                            | .583                                      | .457    | .126    | 89.3                          | 99.8                                          | 81.0 | 18.8  |
| 29    | .543                                            | .591                                      | .470    | .121    | 88.0                          | 97.2                                          | 82.6 | 14.6  |
| 30    | .563                                            | .600                                      | .502    | .098    | 85.7                          | 93.7                                          | 82.5 | 11.2  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of June 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 81.3                            | 6.3                 | 77.5                | 10.1                         | 0.925                            | 9.84                                             | 3.68                                                                | 0.73                                                                |
| 2     | 83.3                            | 8.1                 | 78.4                | 13.0                         | .952                             | 10.04                                            | 5.06                                                                | .67                                                                 |
| 3     | 84.1                            | 4.7                 | 81.3                | 7.5                          | 1.043                            | 11.06                                            | 2.94                                                                | .79                                                                 |
| 4     | 83.4                            | 5.0                 | 80.4                | 8.0                          | .014                             | 10.76                                            | 3.08                                                                | .78                                                                 |
| 5     | 83.5                            | 5.8                 | 80.0                | 9.3                          | .001                             | .62                                              | .59                                                                 | .75                                                                 |
| 6     | 82.4                            | 6.7                 | 78.4                | 10.7                         | 0.952                            | .08                                              | 4.04                                                                | .71                                                                 |
| 7     | 81.6                            | 6.5                 | 77.7                | 10.4                         | .931                             | 9.90                                             | 3.82                                                                | .72                                                                 |
| 8     | 81.1                            | 7.0                 | 76.9                | 11.2                         | .908                             | .64                                              | 4.08                                                                | .70                                                                 |
| 9     | 81.5                            | 7.0                 | 77.3                | 11.2                         | .919                             | .76                                              | .12                                                                 | .70                                                                 |
| 10    | 81.9                            | 7.2                 | 77.6                | 11.5                         | .928                             | .83                                              | .29                                                                 | .70                                                                 |
| 11    | 82.0                            | 6.4                 | 78.2                | 10.2                         | .946                             | 10.05                                            | 3.79                                                                | .73                                                                 |
| 12    | 82.5                            | 6.5                 | 78.6                | 10.4                         | .958                             | .17                                              | .91                                                                 | .72                                                                 |
| 13    | 80.1                            | 5.8                 | 76.0                | 9.9                          | .882                             | 9.41                                             | .46                                                                 | .73                                                                 |
| 14    | 79.7                            | 3.9                 | 77.0                | 6.6                          | .910                             | .75                                              | 2.28                                                                | .81                                                                 |
| 15    | 82.0                            | 3.4                 | 79.6                | 5.8                          | .989                             | 10.56                                            | .12                                                                 | .83                                                                 |
| 16    | 79.5                            | 1.3                 | 78.6                | 2.2                          | .958                             | .34                                              | 0.73                                                                | .93                                                                 |
| 17    | 80.2                            | 3.0                 | 78.1                | 5.1                          | .943                             | .12                                              | 1.77                                                                | .85                                                                 |
| 18    | 81.3                            | 3.8                 | 78.6                | 6.5                          | .958                             | .23                                              | 2.34                                                                | .81                                                                 |
| 19    | 82.0                            | 4.3                 | 79.0                | 7.3                          | .970                             | .35                                              | .67                                                                 | .80                                                                 |
| 20    | 84.0                            | 4.8                 | 81.1                | 7.7                          | 1.037                            | .99                                              | 3.01                                                                | .79                                                                 |
| 21    | 83.5                            | 5.7                 | 80.1                | 9.1                          | .005                             | .64                                              | .52                                                                 | .75                                                                 |
| 22    | 82.7                            | 6.1                 | 79.0                | 9.8                          | 0.970                            | .29                                              | .71                                                                 | .74                                                                 |
| 23    | 79.9                            | 7.0                 | 75.7                | 11.2                         | .873                             | 9.30                                             | .95                                                                 | .70                                                                 |
| 24    | 83.2                            | 5.9                 | 79.7                | 9.4                          | .992                             | 10.53                                            | .59                                                                 | .75                                                                 |
| 25    | 82.9                            | 7.3                 | 78.5                | 11.7                         | .955                             | .10                                              | 4.49                                                                | .69                                                                 |
| 26    | 83.2                            | 8.9                 | 77.9                | 14.2                         | .937                             | 9.88                                             | 5.53                                                                | .64                                                                 |
| 27    | 84.6                            | 7.8                 | 79.9                | 12.5                         | .998                             | 10.50                                            | .04                                                                 | .68                                                                 |
| 28    | 82.9                            | 6.4                 | 79.1                | 10.0                         | .973                             | .32                                              | 3.89                                                                | .73                                                                 |
| 29    | 83.4                            | 4.6                 | 80.6                | 7.4                          | 1.021                            | .86                                              | 2.82                                                                | .79                                                                 |
| 30    | 82.3                            | 3.4                 | 79.9                | 5.8                          | 0.998                            | .65                                              | .15                                                                 | .83                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of June 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 29.526                                          | 29.649                                                       | 29.413  | 0.236   | 84.1                          | 88.5                                                             | 79.0 | 9.5   |
| 1              | .514                                            | .631                                                         | .389    | .242    | 83.9                          | 87.8                                                             | 79.2 | 8.6   |
| 2              | .502                                            | .616                                                         | .382    | .234    | 83.7                          | 87.0                                                             | 79.2 | 7.8   |
| 3              | .491                                            | .609                                                         | .383    | .226    | 83.5                          | 86.7                                                             | 79.0 | 7.7   |
| 4              | .490                                            | .612                                                         | .391    | .218    | 83.3                          | 86.5                                                             | 79.0 | 7.5   |
| 5              | .502                                            | .630                                                         | .405    | .225    | 83.2                          | 86.2                                                             | 79.0 | 7.2   |
| 6              | .514                                            | .634                                                         | .410    | .224    | 83.3                          | 86.4                                                             | 78.8 | 7.6   |
| 7              | .531                                            | .660                                                         | .434    | .226    | 84.3                          | 87.0                                                             | 79.9 | 7.1   |
| 8              | .545                                            | .672                                                         | .433    | .239    | 86.1                          | 89.2                                                             | 79.5 | 9.7   |
| 9              | .549                                            | .670                                                         | .452    | .218    | 88.2                          | 92.0                                                             | 78.6 | 13.4  |
| 10             | .547                                            | .665                                                         | .440    | .225    | 90.4                          | 95.2                                                             | 78.5 | 16.7  |
| 11             | .541                                            | .653                                                         | .434    | .219    | 92.0                          | 96.7                                                             | 78.5 | 18.2  |
| Noon.          | .527                                            | .637                                                         | .405    | .232    | 93.6                          | 98.5                                                             | 78.8 | 19.7  |
| 1              | .507                                            | .617                                                         | .372    | .245    | 94.6                          | 100.4                                                            | 79.4 | 21.0  |
| 2              | .486                                            | .595                                                         | .356    | .239    | 94.8                          | 102.0                                                            | 80.3 | 21.7  |
| 3              | .464                                            | .573                                                         | .338    | .240    | 95.0                          | 103.0                                                            | 81.0 | 22.0  |
| 4              | .451                                            | .559                                                         | .325    | .234    | 94.3                          | 102.6                                                            | 81.3 | 21.3  |
| 5              | .452                                            | .558                                                         | .338    | .220    | 92.4                          | 101.5                                                            | 81.0 | 20.5  |
| 6              | .463                                            | .570                                                         | .347    | .223    | 89.6                          | 98.8                                                             | 78.0 | 20.8  |
| 7              | .482                                            | .604                                                         | .362    | .242    | 87.6                          | 94.0                                                             | 78.0 | 16.0  |
| 8              | .506                                            | .630                                                         | .391    | .239    | 86.5                          | 91.7                                                             | 78.5 | 13.2  |
| 9              | .525                                            | .682                                                         | .410    | .272    | 85.6                          | 90.4                                                             | 79.0 | 11.4  |
| 10             | .541                                            | .666                                                         | .428    | .238    | 84.7                          | 89.0                                                             | 79.0 | 10.0  |
| 11             | .541                                            | .656                                                         | .428    | .228    | 84.4                          | 88.7                                                             | 79.0 | 9.7   |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb-  
Thermometer Means are derived from the observations made at the several  
hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of June 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 81.3                            | 2.8                 | 79.3                | 4.8                          | 0.979                            | 10.48                                            | 1.73                                                                | 0.86                                                                |
| 1              | 81.4                            | 2.5                 | 79.6                | 4.3                          | .989                             | .60                                              | .53                                                                 | .87                                                                 |
| 2              | 81.4                            | 2.3                 | 79.8                | 3.9                          | .995                             | .66                                              | .41                                                                 | .88                                                                 |
| 3              | 81.3                            | 2.2                 | 79.8                | 3.7                          | .995                             | .66                                              | .34                                                                 | .89                                                                 |
| 4              | 81.2                            | 2.1                 | 79.7                | 3.6                          | .992                             | .63                                              | .30                                                                 | .89                                                                 |
| 5              | 81.2                            | 2.0                 | 79.8                | 3.4                          | .995                             | .69                                              | .20                                                                 | .90                                                                 |
| 6              | 81.4                            | 1.9                 | 80.1                | 3.2                          | 1.005                            | .77                                              | .16                                                                 | .90                                                                 |
| 7              | 81.9                            | 2.4                 | 80.2                | 4.1                          | .008                             | .79                                              | .49                                                                 | .88                                                                 |
| 8              | 82.5                            | 3.6                 | 80.0                | 6.1                          | .001                             | .68                                              | 2.27                                                                | .83                                                                 |
| 9              | 82.9                            | 5.3                 | 79.7                | 8.5                          | 0.992                            | .53                                              | 3.23                                                                | .77                                                                 |
| 10             | 82.9                            | 7.5                 | 78.4                | 12.0                         | .952                             | .06                                              | 4.61                                                                | .69                                                                 |
| 11             | 83.3                            | 8.7                 | 78.1                | 13.9                         | .913                             | 9.93                                             | 5.43                                                                | .65                                                                 |
| Noon.          | 83.4                            | 10.2                | 77.3                | 16.3                         | .919                             | .66                                              | 6.42                                                                | .60                                                                 |
| 1              | 83.6                            | 11.0                | 77.0                | 17.6                         | .910                             | .53                                              | 7.02                                                                | .58                                                                 |
| 2              | 83.6                            | 11.2                | 76.9                | 17.9                         | .908                             | .51                                              | .14                                                                 | .57                                                                 |
| 3              | 83.7                            | 11.3                | 76.9                | 18.1                         | .908                             | .51                                              | .23                                                                 | .57                                                                 |
| 4              | 83.5                            | 10.8                | 77.0                | 17.3                         | .910                             | .55                                              | 6.86                                                                | .58                                                                 |
| 5              | 82.9                            | 9.5                 | 77.2                | 15.2                         | .916                             | .65                                              | 5.89                                                                | .62                                                                 |
| 6              | 82.2                            | 7.4                 | 77.8                | 11.8                         | .934                             | .89                                              | 4.44                                                                | .69                                                                 |
| 7              | 81.6                            | 6.0                 | 78.0                | 9.6                          | .940                             | .99                                              | 3.53                                                                | .74                                                                 |
| 8              | 81.6                            | 4.9                 | 78.7                | 7.8                          | .961                             | 10.24                                            | 2.80                                                                | .78                                                                 |
| 9              | 81.5                            | 4.1                 | 78.6                | 7.0                          | .958                             | .23                                              | .53                                                                 | .80                                                                 |
| 10             | 81.0                            | 3.7                 | 78.4                | 6.3                          | .952                             | .19                                              | .23                                                                 | .82                                                                 |
| 11             | 81.3                            | 3.1                 | 79.1                | 5.3                          | .973                             | .42                                              | 1.89                                                                | .85                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of June 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                                       |
|-------|-----------------------|---------------------------------|-----------------------|---------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                                  |
| 1     | 145.0                 | 0.36                            | SE                    | 4.0           | 137.4           | S to 6 A. M., \i to 10 A. M., \i to 5 P. M. S to 11 P. M. T between 1½ & 2½ & at 5 P. M. L at 2 & 4 A. M. R from 1½ to 2½ P. M.  |
| 2     | 144.0                 | ...                             | SE, WSW & S           | ...           | 172.8           | \i to 3 A. M., S to 7 A. M. \i to 7 P. M. S to 11 P. M.                                                                          |
| 3     | 143.0                 | 0.07                            | SSW & S               | 1.0           | 279.1           | S to 10 A. M., \i to 7 P. M. O to 11 P. M. T at 8½ A. M. L on NW at 8 and 9 P. M. Slight R from 6½ to 9½ at 11½ A. M. & 7½ P. M. |
| 4     | 137.0                 | ...                             | WSW                   | 2.0           | 322.0           | O to 6 A. M., S to 10 A. M. \i to 2 P. M. \i to 9 P. M. O to 11 P. M. L at 11 P. M. D at 11½ P. M.                               |
| 5     | 146.0                 | ...                             | W by S & S            | ...           | 280.1           | O to 7 A. M., \i to 2 P. M. \i to 5 P. M. \i to 11 P. M.                                                                         |
| 6     | 147.0                 | ...                             | S by W & S            | 0.2           | 288.6           | \i to 7 A. M., \i to 6 P. M. S to 11 P. M. L between 7 & 8 and at 10 P. M. D between 8 and 9 P. M.                               |
| 7     | 145.0                 | ...                             | SSW & S               | 0.5           | 282.0           | S to 1 A. M., \i and \i to 3 A. M. O to 8 A. M. \i to 6 P. M. B to 9 P. M. \i to 11 P. M.                                        |
| 8     | 141.0                 | ...                             | S & SSW               | 0.6           | 257.0           | \i to 5 A. M., \i to 10 A. M., \i to 6 P. M., \i to 11 P. M.                                                                     |
| 9     | 145.0                 | ...                             | S & S by E            | 0.3           | 239.1           | \i to 8 A. M., \i to 7 P. M. B to 11 P. M.                                                                                       |
| 10    | 147.0                 | ...                             | S by E & SSE          | 0.4           | 234.9           | B to 4 A. M., \i to 7 A. M., \i to 5 P. M., \i to 11 P. M.                                                                       |
| 11    | 140.2                 | ...                             | SSE & SE              | ...           | 179.6           | \i to 2 A. M. S to 9 A. M., \i to 3 P. M. \i to 11 P. M. L on NE between 7 & 8 P. M.                                             |
| 12    | 144.0                 | ...                             | SE & E by N           | ...           | 120.8           | \i to 3 A. M. S to 8 A. M., \i to 5 P. M. S to 11 P. M. T at 4½ P. M. L on SW from 8 to 10 P. M. D at 5½ A. M. 3½ & 4½ P. M.     |

\i Cirri, —i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i Nimb, \i Cirro-cumuli, B clear, S strati, O overcast, T thunder, L lightning, R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of June 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                                                                                                                                                    |
|-------|-----------------------|---------------------------------|-----------------------|---------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                                                                                                                                               |
|       |                       | Inches                          |                       | lb            | Mile.           |                                                                                                                                                                                                                                               |
| 13    | 136.5                 | 1.64                            | SE & W                | 9.0           | 102.1           | S to 6 A. M., \i to 10 A. M. S to 3 P. M. O to 11 P. M. High wind between 3½ & 4½ P. M. T & L between 4 & 5 P. M. R at 4, 5 & 7 P. M.                                                                                                         |
| 14    | 138.2                 | 0.86                            | W S W & Variable      | 4.3           | 166.9           | O to 9 A. M., \i to 4 P. M. O to 11 P. M. High wind from 5½ to 5¾ P. M. T between 2 & 3 A. M. & from 4 to 5½ P. M. L between 2 & 3 A. M., & from 5½ to 10 P. M. R at 2½ A. M., & from 5½ to 8 P. M. O to 11 A. M. S to 11 P. M. T at 3½ P. M. |
| 15    | 121.0                 | ...                             | E S E & Variable      | ...           | 97.6            | O to 6 P. M. S to 11 P. M. T at 9½ A. M. L on W at 8 P. M. Light R after intervals.                                                                                                                                                           |
| 16    | ...                   | 0.06                            | E & S                 | ...           | 90.0            | S to 11 A. M., \i to 6 P. M. O to 8 P. M. B to 11 P. M. Brisk wind between 6½ & 7 P. M. Slight R at 3½, 7 A. M. & between 7 & 8 P. M.                                                                                                         |
| 17    | 137.0                 | 0.50                            | S & S W               | 2.8           | 81.2            | B to 3 A. M., \i to 7 A. M., \i to 12 A. M., \i to 3 P. M. S to 11 P. M. L at 8 & 9 P. M. T & R between 9 & 10 P. M.                                                                                                                          |
| 18    | 139.0                 | 0.43                            | S S W & S W           | ...           | 131.9           | S to 8 A. M., \i to 4 P. M. S to 11 P. M. L at 8 P. M.                                                                                                                                                                                        |
| 19    | 139.0                 | ...                             | S S W & S W           | ...           | 155.9           | S to 2 A. M. O to 7 A. M., \i to 9 A. M., \i to 12 A. M., \i to 5 P. M. O to 11 P. M. L on N E at 8 P. M.                                                                                                                                     |
| 20    | 141.5                 | ...                             | S W & S               | ...           | 113.1           | O to 2 A. M. S to 8 A. M., \i to 4 P. M. S to 7 P. M. O to 11 P. M. \i to 12 A. M. S to 7 P. M. O to 11 P. M. High wind from 8 to 8½ & 9½ to 10 P. M. T at 9½ P. M. L from 7 to 11 P. M. Light R at 8½ & 10 P. M.                             |
| 21    | 140.0                 | ...                             | S S W & S W           | ...           | 177.9           |                                                                                                                                                                                                                                               |
| 22    | 142.0                 | 0.06                            | S S W & S W           | 9.0           | 117.8           |                                                                                                                                                                                                                                               |

\i Cirri,—i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i Nimbi,  
\i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning  
R. rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of June 1873.*

Solar Radiation, Weather, &c.,

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                                                                                  |
|-------|-----------------------|---------------------------------|-----------------------|---------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                                                                             |
|       | °                     | Inches                          |                       |               |                 |                                                                                                                                                                             |
| 23    | 146.0                 | 0.02                            | S S W                 | 0.5           | 154.7           | O to 6 A. M., \i & \i to 2 P. M. \i to 7 P. M. S to 11 P. M. L at midnight & from 8 to 10 P. M. Light R at midnight & 9½ P. M.                                              |
| 24    | 145.0                 | ...                             | S S W & S W           | 3.2           | 79.2            | \i to 1 A. M. O to 6 A. M., \i to 1 P. M. S to 11 P. M. Brisk wind at 9½ P. M. L at 8 & 9 P. M. D at 4½ A. M.                                                               |
| 25    | 138.5                 | ...                             | N E & Variable.       | ...           | 73.8            | O to 8 A. M. S to 12 A. M., \i to 11 P. M.                                                                                                                                  |
| 26    | 145.0                 | ...                             | N W & S by W          | ...           | 106.9           | B to 2 A. M., \i to 8 A. M. B to 11 A. M., \i to 6 P. M. B to 11 P. M. L on N at 10 P. M.                                                                                   |
| 27    | 145.6                 | ...                             | S by W & S            | ...           | 108.2           | Chiefly B.                                                                                                                                                                  |
| 28    | 143.9                 | 0.30                            | S & S S W             | 4.3           | 169.6           | S to 5 A. M., \i to 11 A. M. Clouds of different kinds to 4 P. M. O to 11 P. M. High wind between 5½ & 5¾ P. M. T at 6 P. M. L from 6 to 9 P. M. Slight R from 6 to 8 P. M. |
| 29    | 142.0                 | ...                             | S S W & S S E         | 0.9           | 139.8           | B to 1 A. M. S to 8 A. M., \i & \i to 3 P. M. S to 7 P. M. O to 11 P. M. T from 2½ to 4½ P. M. D at 4 & 6½ P. M.                                                            |
| 30    | 136.8                 | ...                             | S & S E               | 0.4           | 121.6           | S to 5 A. M., \i to 7 A. M., \i to 12 A. M. O to 4 P. M. S to 8 P. M. O to 11 P. M. T from 12½ A. M., to 2½ P. M. L at 2½ P. M. D at 12½ A. M. 1 & 3 P. M.                  |

\i Cirri —i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati \i Nimbi, \i Cirro-Cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of June 1873.*

MONTHLY RESULTS.

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|                                                                 | Inches. |
|-----------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..               | 29.508  |
| Max. height of the Barometer occurred at 9 P. M. on the 6th ... | 29.682  |
| Min. height of the Barometer occurred at 4 P. M. on the 1st ... | 29.325  |
| Extreme range of the Barometer during the month ...             | 0.357   |
| Mean of the daily Max. Pressures ... ..                         | 29.561  |
| Ditto ditto Min. ditto ... ..                                   | 29.443  |
| Mean daily range of the Barometer during the month ...          | 0.118   |

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|                                                             | °     |
|-------------------------------------------------------------|-------|
| Mean Dry Bulb Thermometer for the month ... ..              | 87.9  |
| Max. Temperature occurred at 3 P. M. on the 2nd ... ..      | 103.0 |
| Min. Temperature occurred at 6 & 7 P. M. on the 13th ... .. | 78.0  |
| Extreme range of the Temperature during the month ... ..    | 25.0  |
| Mean of the daily Max. Temperature ... ..                   | 96.1  |
| Ditto ditto Min. ditto, ... ..                              | 82.0  |
| Mean daily range of the Temperature during the month ...    | 14.1  |

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|                                                               |      |
|---------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..                | 82.2 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ... | 5.7  |
| Computed Mean Dew-point for the month ... ..                  | 78.8 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ...   | 9.1  |

|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.964   |

---

|                                                                        | Troy grain. |
|------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                             | 10.25       |
| Additional Weight of Vapour required for complete saturation ...       | 3.39        |
| Mean degree of humidity for the month, complete saturation being unity | 0.75        |

|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 141.4 |

---

|                                                                                                      | Inches.      |
|------------------------------------------------------------------------------------------------------|--------------|
| Rained 16 days.—Max. fall of rain during 24 hours' ... ..                                            | 1.64         |
| Total amount of rain during the month ... ..                                                         | 4.30         |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month ... .. | 3.44         |
| Prevailing direction of the Wind ... ..                                                              | S. S. W & S. |

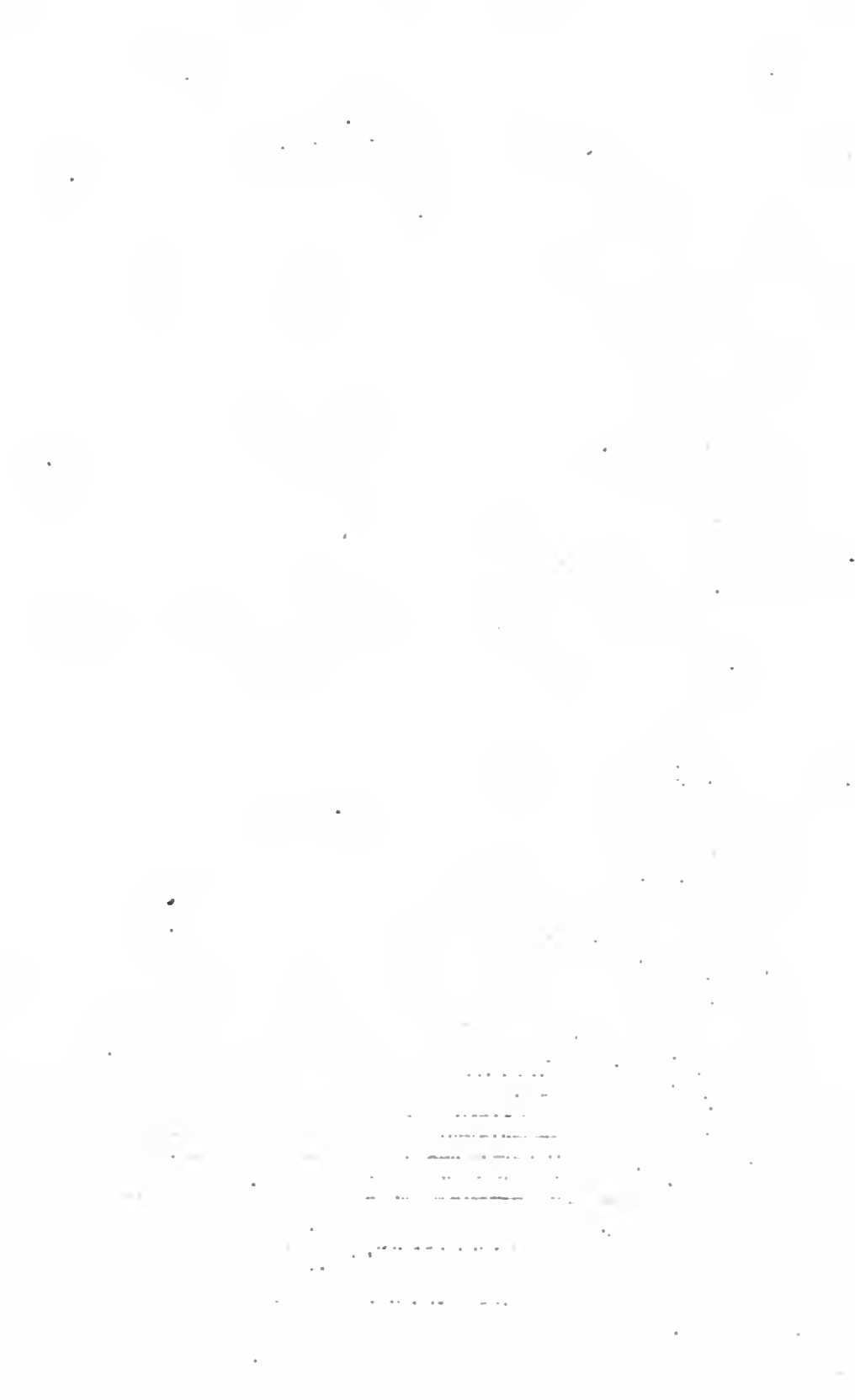
\* Height 70 feet 10 inches above ground.

### Meteorological Observations.

### MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

[illegible]



# Meteorological Observations.

11

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of July 1873.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at 32° Fahr. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|-------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                 | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                         | Inches.                                   | Inches. | Inches. | °                             | °                                             | °    | °     |
| 1     | 29.561                                          | 29.605                                    | 29.488  | 0.117   | 85.2                          | 91.7                                          | 82.0 | 9.7   |
| 2     | .556                                            | .606                                      | .517    | .089    | 83.7                          | 87.5                                          | 81.0 | 6.5   |
| 3     | .563                                            | .608                                      | .507    | .101    | 83.0                          | 87.0                                          | 80.5 | 6.5   |
| 4     | .599                                            | .548                                      | .437    | .111    | 85.1                          | 87.4                                          | 80.0 | 7.4   |
| 5     | .493                                            | .534                                      | .425    | .109    | 81.5                          | 85.8                                          | 79.2 | 6.6   |
| 6     | .474                                            | .515                                      | .414    | .101    | 83.0                          | 87.0                                          | 79.4 | 7.6   |
| 7     | .484                                            | .568                                      | .490    | .138    | 83.8                          | 91.4                                          | 80.5 | 10.9  |
| 8     | .522                                            | .565                                      | .456    | .109    | 83.8                          | 87.5                                          | 81.0 | 6.5   |
| 9     | .478                                            | .525                                      | .428    | .097    | 83.5                          | 88.4                                          | 81.4 | 7.0   |
| 10    | .459                                            | .503                                      | .394    | .109    | 84.8                          | 92.0                                          | 80.2 | 11.8  |
| 11    | .459                                            | .506                                      | .406    | .100    | 83.3                          | 90.0                                          | 80.5 | 9.5   |
| 12    | .426                                            | .479                                      | .357    | .122    | 82.4                          | 87.0                                          | 80.0 | 7.0   |
| 13    | .387                                            | .429                                      | .317    | .112    | 82.8                          | 88.6                                          | 80.5 | 8.1   |
| 14    | .427                                            | .507                                      | .371    | .136    | 81.3                          | 83.0                                          | 79.6 | 3.4   |
| 15    | .491                                            | .528                                      | .431    | .097    | 82.6                          | 89.0                                          | 79.5 | 9.5   |
| 16    | .473                                            | .515                                      | .403    | .112    | 84.0                          | 88.5                                          | 81.0 | 7.5   |
| 17    | .429                                            | .494                                      | .364    | .130    | 84.5                          | 91.0                                          | 81.0 | 10.0  |
| 18    | .299                                            | .404                                      | .194    | .210    | 80.5                          | 82.2                                          | 79.5 | 2.7   |
| 19    | .379                                            | .463                                      | .314    | .149    | 83.6                          | 89.3                                          | 79.5 | 9.8   |
| 20    | .461                                            | .521                                      | .417    | .104    | 85.5                          | 90.2                                          | 82.0 | 8.2   |
| 21    | .512                                            | .552                                      | .477    | .075    | 84.2                          | 91.0                                          | 81.8 | 9.2   |
| 22    | .498                                            | .559                                      | .412    | .147    | 85.6                          | 92.0                                          | 81.0 | 11.0  |
| 23    | .453                                            | .503                                      | .386    | .117    | 83.4                          | 87.6                                          | 81.0 | 6.6   |
| 24    | .466                                            | .528                                      | .410    | .118    | 83.6                          | 88.8                                          | 80.6 | 8.2   |
| 25    | .516                                            | .565                                      | .456    | .109    | 83.9                          | 88.5                                          | 80.3 | 8.2   |
| 26    | .513                                            | .571                                      | .441    | .130    | 85.1                          | 90.3                                          | 81.8 | 8.5   |
| 27    | .468                                            | .515                                      | .426    | .089    | 82.4                          | 84.5                                          | 80.5 | 4.0   |
| 28    | .511                                            | .577                                      | .462    | .115    | 81.1                          | 86.0                                          | 77.5 | 8.5   |
| 29    | .559                                            | .615                                      | .5      | .106    | 81.8                          | 87.0                                          | 77.5 | 9.5   |
| 30    | .585                                            | .616                                      | .525    | .091    | 84.4                          | 89.3                                          | 80.2 | 9.1   |
| 31    | .559                                            | .597                                      | .499    | .098    | 83.0                          | 85.8                                          | 80.5 | 5.3   |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of July 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 81.5                            | 3.7                 | 78.9                | 6.3                          | 0.967                            | 10.34                                            | 2.27                                                                | 0.82                                                                |
| 2     | 80.6                            | 3.1                 | 78.4                | 5.3                          | .952                             | .21                                              | 1.86                                                                | .85                                                                 |
| 3     | 80.5                            | 2.5                 | 78.7                | 4.3                          | .961                             | .33                                              | .49                                                                 | .87                                                                 |
| 4     | 80.6                            | 2.5                 | 78.8                | 4.3                          | .964                             | .36                                              | .60                                                                 | .87                                                                 |
| 5     | 80.1                            | 1.4                 | 79.1                | 2.4                          | .973                             | .40                                              | 0.82                                                                | .93                                                                 |
| 6     | 80.3                            | 2.7                 | 78.4                | 4.6                          | .952                             | .21                                              | 1.61                                                                | .86                                                                 |
| 7     | 81.1                            | 2.7                 | 79.2                | 4.6                          | .976                             | .45                                              | .65                                                                 | .86                                                                 |
| 8     | 81.6                            | 2.2                 | 80.1                | 3.7                          | 1.005                            | .75                                              | .35                                                                 | .89                                                                 |
| 9     | 81.3                            | 2.2                 | 79.8                | 3.7                          | 0.995                            | .66                                              | .34                                                                 | .89                                                                 |
| 10    | 81.2                            | 3.6                 | 78.7                | 6.1                          | .961                             | .29                                              | 2.17                                                                | .83                                                                 |
| 11    | 81.2                            | 2.1                 | 79.7                | 3.6                          | .992                             | .63                                              | 1.30                                                                | .89                                                                 |
| 12    | 80.5                            | 1.9                 | 79.2                | 3.2                          | .976                             | .50                                              | .11                                                                 | .90                                                                 |
| 13    | 81.2                            | 1.6                 | 80.1                | 2.7                          | 1.005                            | .77                                              | 0.98                                                                | .92                                                                 |
| 14    | 79.9                            | 1.4                 | 78.9                | 2.4                          | 0.967                            | .43                                              | .81                                                                 | .93                                                                 |
| 15    | 80.8                            | 1.8                 | 79.5                | 3.1                          | .986                             | .60                                              | 1.08                                                                | .91                                                                 |
| 16    | 81.3                            | 2.2                 | 80.3                | 3.7                          | 1.011                            | .82                                              | .35                                                                 | .89                                                                 |
| 17    | 82.1                            | 2.4                 | 80.4                | 4.1                          | .014                             | .85                                              | .50                                                                 | .88                                                                 |
| 18    | 79.6                            | 0.9                 | 79.0                | 1.5                          | 0.970                            | .46                                              | 0.52                                                                | .95                                                                 |
| 19    | 80.8                            | 2.8                 | 78.8                | 4.8                          | .964                             | .34                                              | 1.69                                                                | .86                                                                 |
| 20    | 82.2                            | 3.3                 | 79.9                | 5.6                          | .998                             | .65                                              | 2.07                                                                | .84                                                                 |
| 21    | 82.1                            | 2.1                 | 80.6                | 3.6                          | 1.021                            | .92                                              | 1.32                                                                | .89                                                                 |
| 22    | 82.0                            | 3.6                 | 79.5                | 6.1                          | 0.986                            | .53                                              | 2.23                                                                | .83                                                                 |
| 23    | 81.2                            | 2.2                 | 79.7                | 3.7                          | .992                             | .63                                              | 1.33                                                                | .89                                                                 |
| 24    | 81.2                            | 2.4                 | 79.5                | 4.1                          | .986                             | .57                                              | .46                                                                 | .88                                                                 |
| 25    | 81.3                            | 2.6                 | 79.5                | 4.4                          | .986                             | .57                                              | .56                                                                 | .87                                                                 |
| 26    | 81.7                            | 3.4                 | 79.3                | 5.8                          | .979                             | .46                                              | 2.11                                                                | .83                                                                 |
| 27    | 80.8                            | 1.6                 | 79.7                | 2.7                          | .992                             | .66                                              | 0.95                                                                | .92                                                                 |
| 28    | 79.5                            | 1.6                 | 78.4                | 2.7                          | .952                             | .25                                              | .92                                                                 | .92                                                                 |
| 29    | 79.2                            | 2.6                 | 77.4                | 4.4                          | .922                             | 9.93                                             | 1.47                                                                | .87                                                                 |
| 30    | 80.7                            | 3.7                 | 78.1                | 6.3                          | .943                             | 10.10                                            | 2.21                                                                | .82                                                                 |
| 31    | 80.2                            | 2.8                 | 78.2                | 4.8                          | .946                             | .15                                              | 1.67                                                                | .86                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of July 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 29.509                                          | 29.609                                                       | 29.335  | 0.274   | 81.7                          | 83.9                                                             | 77.6 | 6.3   |
| 1              | .495                                            | .603                                                         | .325    | .278    | 81.5                          | 83.5                                                             | 77.5 | 6.0   |
| 2              | .483                                            | .598                                                         | .321    | .277    | 81.3                          | 83.2                                                             | 77.5 | 5.7   |
| 3              | .471                                            | .590                                                         | .314    | .276    | 81.1                          | 82.8                                                             | 77.8 | 5.0   |
| 4              | .464                                            | .583                                                         | .323    | .260    | 80.9                          | 82.6                                                             | 77.9 | 4.7   |
| 5              | .475                                            | .600                                                         | .339    | .261    | 80.7                          | 82.5                                                             | 78.0 | 4.5   |
| 6              | .486                                            | .602                                                         | .311    | .261    | 80.8                          | 82.8                                                             | 78.5 | 4.3   |
| 7              | .498                                            | .614                                                         | .323    | .291    | 81.4                          | 84.0                                                             | 79.5 | 4.5   |
| 8              | .511                                            | .612                                                         | .332    | .280    | 82.6                          | 84.8                                                             | 80.5 | 4.3   |
| 9              | .516                                            | .615                                                         | .312    | .303    | 84.0                          | 87.0                                                             | 80.0 | 7.0   |
| 10             | .518                                            | .616                                                         | .311    | .305    | 85.0                          | 88.0                                                             | 81.0 | 7.0   |
| 11             | .509                                            | .616                                                         | .291    | .325    | 85.8                          | 90.0                                                             | 80.7 | 9.3   |
| Noon.          | .494                                            | .596                                                         | .260    | .336    | 86.6                          | 91.7                                                             | 80.8 | 10.9  |
| 1              | .475                                            | .580                                                         | .231    | .349    | 86.9                          | 91.0                                                             | 80.2 | 10.8  |
| 2              | .458                                            | .559                                                         | .201    | .355    | 86.7                          | 91.6                                                             | 81.5 | 10.1  |
| 3              | .443                                            | .544                                                         | .197    | .347    | 86.2                          | 92.0                                                             | 81.5 | 10.5  |
| 4              | .430                                            | .538                                                         | .194    | .344    | 85.8                          | 91.5                                                             | 81.0 | 10.5  |
| 5              | .431                                            | .525                                                         | .211    | .314    | 85.1                          | 88.8                                                             | 79.5 | 9.3   |
| 6              | .442                                            | .539                                                         | .224    | .315    | 84.2                          | 88.6                                                             | 77.7 | 10.9  |
| 7              | .462                                            | .561                                                         | .261    | .300    | 83.3                          | 86.7                                                             | 77.5 | 9.2   |
| 8              | .483                                            | .582                                                         | .293    | .289    | 82.8                          | 86.0                                                             | 77.5 | 8.5   |
| 9              | .504                                            | .595                                                         | .326    | .269    | 82.4                          | 85.1                                                             | 77.5 | 7.6   |
| 10             | .517                                            | .607                                                         | .344    | .263    | 82.1                          | 84.7                                                             | 77.5 | 7.2   |
| 11             | .517                                            | .615                                                         | .339    | .276    | 81.9                          | 84.2                                                             | 77.5 | 6.7   |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb  
Thermometer Means are derived from the observations made at the several  
hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of July 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 80.4                            | 1.3                 | 79.5                | 2.2                          | 0.986                            | 10.62                                            | 0.75                                                                | 0.93                                                                |
| 1              | 80.2                            | 1.3                 | 79.3                | 2.2                          | .979                             | .55                                              | .76                                                                 | .93                                                                 |
| 2              | 80.0                            | 1.3                 | 79.1                | 2.2                          | .973                             | .49                                              | .75                                                                 | .93                                                                 |
| 3              | 79.9                            | 1.2                 | 79.1                | 2.0                          | .973                             | .49                                              | .75                                                                 | .93                                                                 |
| 4              | 79.7                            | 1.2                 | 78.9                | 2.0                          | .967                             | .43                                              | .67                                                                 | .94                                                                 |
| 5              | 79.6                            | 1.1                 | 78.8                | 1.9                          | .964                             | .40                                              | .64                                                                 | .94                                                                 |
| 6              | 79.7                            | 1.1                 | 78.9                | 1.9                          | .967                             | .43                                              | .64                                                                 | .94                                                                 |
| 7              | 80.2                            | 1.2                 | 79.4                | 2.0                          | .983                             | .58                                              | .69                                                                 | .94                                                                 |
| 8              | 80.8                            | 1.8                 | 79.5                | 3.1                          | .986                             | .60                                              | 1.08                                                                | .91                                                                 |
| 9              | 81.3                            | 2.7                 | 79.4                | 4.6                          | .983                             | .51                                              | .66                                                                 | .86                                                                 |
| 10             | 81.7                            | 3.3                 | 79.4                | 5.6                          | .983                             | .49                                              | 2.04                                                                | .84                                                                 |
| 11             | 81.8                            | 4.0                 | 79.0                | 6.8                          | .970                             | .35                                              | .48                                                                 | .81                                                                 |
| Noon.          | 82.2                            | 4.4                 | 79.6                | 7.0                          | .989                             | .54                                              | .60                                                                 | .80                                                                 |
| 1              | 82.4                            | 4.5                 | 79.7                | 7.2                          | .992                             | .57                                              | .68                                                                 | .80                                                                 |
| 2              | 82.4                            | 4.3                 | 79.8                | 6.9                          | .995                             | .60                                              | .58                                                                 | .80                                                                 |
| 3              | 82.0                            | 4.2                 | 79.1                | 7.1                          | .973                             | .38                                              | .61                                                                 | .80                                                                 |
| 4              | 82.0                            | 3.8                 | 79.3                | 6.5                          | .979                             | .44                                              | .39                                                                 | .81                                                                 |
| 5              | 81.6                            | 3.5                 | 79.1                | 6.0                          | .973                             | .40                                              | .17                                                                 | .83                                                                 |
| 6              | 81.0                            | 3.2                 | 78.8                | 5.4                          | .964                             | .34                                              | 1.90                                                                | .85                                                                 |
| 7              | 80.9                            | 2.4                 | 79.2                | 4.1                          | .976                             | .48                                              | .45                                                                 | .88                                                                 |
| 8              | 80.7                            | 2.1                 | 79.2                | 3.6                          | .976                             | .48                                              | .27                                                                 | .89                                                                 |
| 9              | 80.6                            | 1.8                 | 79.3                | 3.1                          | .979                             | .53                                              | .08                                                                 | .91                                                                 |
| 10             | 80.6                            | 1.5                 | 79.5                | 2.6                          | .986                             | .60                                              | 0.91                                                                | .92                                                                 |
| 11             | 80.5                            | 1.4                 | 79.5                | 2.4                          | .986                             | .62                                              | .82                                                                 | .93                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants:

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of July 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |                |                 | General aspect of the Sky.                                                                                                                                               |
|-------|-----------------------|---------------------------------|-----------------------|----------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure. | Daily Velocity. |                                                                                                                                                                          |
|       | °                     | Inches                          |                       | lb             | Miles           |                                                                                                                                                                          |
| 1     | 137.5                 | 0.09                            | E S E & S by E        | 0.2            | 128.0           | O to 5 A. M. S to 8 A. M. $\wedge$ i to 6 P. M., $\wedge$ i & $\wedge$ i to 11 P. M. Light R between 5 & 6, at 12½ A. M., & 6½ P. M.                                     |
| 2     | 132.5                 | 0.13                            | S E & S S E           | 0.7            | 163.9           | S to 6 A. M., $\wedge$ i to 6 P. M., $\wedge$ i to 11 P. M. T at 6½ A. M. Slight R at 6, 9½, 10½ A. M. & 1 P. M.                                                         |
| 3     | 134.0                 | 0.51                            | S E & S by E          | 1.0            | 117.5           | B to 6 A. M., $\wedge$ i to 5 P. M. $\wedge$ to 9 P. M. S to 11 P. M. T between 12 A. M., & 1 P. M. Slight R between 9 & 10 at 12½ A. M. 1½ between 3 & 4 & at 10½ P. M. |
| 4     | 130.0                 | 0.16                            | S E & S               | 0.5            | 91.0            | $\wedge$ i & $\wedge$ i to 6 A. M., $\wedge$ i to 9 P. M. O to 11 P. M. T at 4½ P. M. Slight R at 10½ A. M., 2½, 9½, 10½ & 11½ P. M.                                     |
| 5     | ...                   | 0.42                            | S & S E               | 1.2            | 126.2           | O to 11 A. M., $\wedge$ i to 6 P. M., $\wedge$ i to 11 P. M. Slight R between 1 & 2, at 6½, 9½, 10½ A. M., between 1 & 2 & at 3½ P. M.                                   |
| 6     | 131.0                 | 0.04                            | S                     | ...            | 115.8           | B to 2 A. M. O to 8 A. M., $\wedge$ i to 5 P. M., $\wedge$ i to 11 P. M. Light R at 5, 7 A. M., & 1 P. M.                                                                |
| 7     | 144.5                 | 0.35                            | S S E & S             | 2.8            | 36.0            | $\wedge$ i & $\wedge$ i to 2 A. M. O to 8 A. M. $\wedge$ i to 4 P. M.; $\wedge$ i to 9 P. M. S to 11 P. M. Slight R at 5½, 6, 7 A. M. 2½ & 4½ P. M.                      |
| 8     | 132.0                 | 0.42                            | E S E & S E           | ...            | 158.1           | $\wedge$ i to 3 A. M. O to 6 A. M., $\wedge$ i to 4 P. M. S to 11 P. M. R at 8½ from 12½ A. M. 2, at 4½ & 5½ P. M.                                                       |
| 9     | 147.0                 | ...                             | S & S S E             | ...            | 66.9            | O to 1 A. M., $\wedge$ i & $\wedge$ i to 4 A. M., $\wedge$ i to 12 A. M. O to 4 P. M. $\wedge$ i to 11 P. M. T between 1 & 2 P. M. D at midnight 2½ & 4 P. M.            |
| 10    | 139.0                 | 0.41                            | S by E & S W          | ...            | 112.9           | $\wedge$ i to 2 A. M., $\wedge$ i to 8 A. M., $\wedge$ i to 3 P. M. O to 11 P. M. T between 5 & 6 and at 11½ P. M. Lat 11 P. M. Slight R from 5 to 11½ P. M.             |

$\wedge$  i Cirri, — i Strati,  $\wedge$  i Cumuli,  $\wedge$  i Cirro-strati,  $\wedge$  i Cumulo-strati,  $\wedge$  i Nimib,  
 $\wedge$  i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning,  
R rain, D drizzle.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of July 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge<br>1½ ft. above<br>Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                                                                  |
|-------|-----------------------|---------------------------------------|-----------------------|---------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                       | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                                                             |
|       | °                     | Inches                                |                       | lb            | Mile.           |                                                                                                                                                             |
| 11    | 141.3                 | 0.52                                  | S W & S S W           | ...           | 106.8           | O to 11 A. M., $\nearrow$ to 2 P. M. O to 11 P. M. L at midnight, 3 A. M. & 11½ P. M. Slight R after intervals.                                             |
| 12    | 134.5                 | 1.10                                  | S S W & Variable      | 0.8           | 88.8            | S to 12 A. M. O to 5 P. M. S 11 P. M. L from midnight to 2 A. M., & at 1½ P. M. T & R from 1½ to 3 P. M.                                                    |
| 13    | 137.8                 | 0.10                                  | S S W & S W           | ...           | 47.6            | Chiefly O. Slight R at 1, 1½, 2½ & 5 P. M.                                                                                                                  |
| 14    | ...                   | 0.19                                  | S W & W S W           | ...           | 13.9            | Chiefly O. Slight R after intervals.                                                                                                                        |
| 15    | 141.0                 | 0.16                                  | S W                   | ...           | 148.0           | Clouds of different kinds. T at 3½ & 8 P. M. L at 8 P. M. Slight R after intervals from 10½ A. M.                                                           |
| 16    | 128.0                 | 0.07                                  | S W & S S W           | ...           | 31.4            | B to 2 A. M., $\nearrow$ to 5 A. M., $\nearrow$ to 10 A. M., O to 2 P. M. $\nearrow$ to 6 P. M. S to 11 P. M. Light R. on 10½ A. M. 2 & between 6 & 7 P. M. |
| 17    | 142.0                 | 0.48                                  | Variable              | 1.0           | 97.6            | S to 5 A. M., $\nearrow$ to 3 P. M. O to 11 P. M. T at 3½ & 9 P. M. Slight R at 3, 11½, 12½ A. M., 3½, 4½ & 8½ P. M.                                        |
| 18    | ...                   | 1.80                                  | N N E & Variable      | ...           | 184.0           | Chiefly O. T at 2 P. M. R nearly the whole day.                                                                                                             |
| 19    | 140.0                 | 0.31                                  | S S W                 | 1.0           | 230.0           | O to 5 A. M., $\nearrow$ to 10 A. M., $\nearrow$ to 8 P. M. B to 11 P. M. L on an W at 8 P. M. R at midnight.                                               |
| 20    | 140.0                 | 0.07                                  | S S W                 | ...           | 193.3           | S to 4 A. M., $\nearrow$ to 6 A. M., $\nearrow$ to 7 P. M. B to 11 P. M. T at 2½ P. M. Slight R at 3½ P. M.                                                 |
| 21    | 138.0                 | 0.66                                  | S S W & S by W        | ...           | 92.2            | S to 9 A. M., $\nearrow$ to 3 P. M. O to 6 P. M., $\nearrow$ & $\nearrow$ to 11 P. M. T from 1 to 4 P. M. R at 1 & 4½ P. M.                                 |

$\nearrow$  i Cirri, — i Strati,  $\nearrow$  i Cumuli,  $\nearrow$  i Cirro-strati,  $\nearrow$  i Cumulo-strati,  $\nearrow$  i Nimbi,  $\nearrow$  i Cirro-cumuli, B clear, S straton, O overcast, T thunder, L lightning  
R. rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of July 1873.*

Solar Radiation, Weather, &c.,

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                      |                |                 | General aspect of the Sky.                                                                                                            |
|-------|-----------------------|---------------------------------|----------------------------|----------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction.      | Max. Pressure. | Daily Velocity. |                                                                                                                                       |
| 22    | 137.0                 | Inches ...                      | SbyW,E&EbyN                | ...            | 60.6            | S to 4 A. M., \i to 7 A. M., \i to 10 A. M., \i to 7 P. M., \i to 11 P. M. L on W at 8 P. M. D at 5½ P. M.                            |
| 23    | 128.5                 | 0.33                            | E by N & E                 | 0.8            | 165.2           | \i to 4 A. M. O to 12 A. M. clouds of Different kinds to 11 P. M. T between 11 & 12 A. M. L at 9 & 10 P. M. Slight R after intervals. |
| 24    | 138.8                 | 0.38                            | E & S                      | 1.4            | 219.4           | S to 5 A. M. O to 9 A. M., \i to 6 P. M. B to 11 P. M. T at 12½ A. M. R between 11 & 12 A. M., at 3½, 5½ and 7½ P. M.                 |
| 25    | 138.7                 | 0.02                            | SSE,SSW&Sby <sup>[W]</sup> | 0.4            | 203.8           | Clouds of Different kinds. Light R at 2½, 3½, 10½ 11 & 12 A. M.                                                                       |
| 26    | 134.0                 | ...                             | S S W & S W                | 0.8            | 157.5           | S to 11 A. M., \i & \i to 3 P. M. O to 11 P. M. L from 7½ to 11 P. M. D at 2½, 3½ A. M. R at 11 P. M.                                 |
| 27    | ...                   | *2.05                           | S W                        | ...            | 157.0           | O to 8 P. M. S to 11 P. M. T from 1½ to 5 A. M. L at 2 A. M. R from midnight to 12 A. M.                                              |
| 28    | ...                   | 3.26                            | S W                        | 2.0            | 111.3           | \i and \i to 4 A. M. O to 11 P. M. T at 5½ P. M. D at 5½ A. M. R from 1½ to 11 P. M.                                                  |
| 29    | 130.0                 | 0.73                            | W & S W                    | 3.5            | 203.3           | Chiefly O. Slight R from midnight to 6 A. M., at 2 & between 7 and 8 P. M.                                                            |
| 30    | 136.5                 | ...                             | S W & S S W                | 1.2            | 197.4           | S to 3 A. M., \i to 1 P. M. O to 4 P. M. S to 11 P. M.                                                                                |
| 31    | 95.2                  | ...                             | S W & S                    | ...            | 107.0           | O. L on S W at 8 & 9 P. M. D at 7, 8, 10½ A. M., 7½ & 11½ P. M.                                                                       |

\i Cirri —i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati \i Nimbi,  
\i Cirro-Cumuli, B clear, S straton, O overcast, T thunder, L lightning,  
R rain, D drizzle.

\* Fell on the 26th and 27th.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of July 1873.*

MONTHLY RESULTS.

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|                                                                        | Inches. |
|------------------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..                      | 29.483  |
| Max. height of the Barometer occurred at 10 and 11 A.M. on the 30th... | 29.616  |
| Min. height of the Barometer occurred at 4 P. M. on the 18th ...       | 29.194  |
| Extreme range of the Barometer during the month ... ..                 | 0.422   |
| Mean of the daily Max. Pressures ... ..                                | 29.536  |
| Ditto ditto Min. ditto ... ..                                          | 29.422  |
| Mean daily range of the Barometer during the month ... ..              | 0.114   |

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|                                                                        | °    |
|------------------------------------------------------------------------|------|
| Mean Dry Bulb Thermometer for the month ... ..                         | 83.4 |
| Max. Temperature occurred at 3 P. M. on the 10th and 22nd ...          | 92.0 |
| Min. Temperature occurred at 10 P.M. and 2 A.M. on the 28th and 29th.. | 77.5 |
| Extreme range of the Temperature during the month ... ..               | 14.5 |
| Mean of the daily Max. Temperature ... ..                              | 88.2 |
| Ditto ditto Min. ditto, ... ..                                         | 80.4 |
| Mean daily range of the Temperature during the month ... ..            | 7.8  |

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|                                                               |      |
|---------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..                | 80.9 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ... | 2.5  |
| Computed Mean Dew-point for the month ... ..                  | 79.1 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ...   | 4.3  |

|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.973   |

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|                                                                        | Troy grain. |
|------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                             | 10.45       |
| Additional Weight of Vapour required for complete saturation ...       | 1.51        |
| Mean degree of humidity for the month, complete saturation being unity | 0.87        |

|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 135.0 |

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|                                                                                                      | Inches.         |
|------------------------------------------------------------------------------------------------------|-----------------|
| Rained 30 days,—Max. fall of rain during 24 hours' ... ..                                            | 3.26            |
| Total amount of rain during the month ... ..                                                         | 14.76           |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month ... .. | 13.60           |
| Prevailing direction of the Wind ... ..                                                              | S. W & S. S. W. |

\* Height 70 feet 10 inches above ground.





*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of August 1873.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at 32° Fahit. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|--------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                  | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                          | Inches.                                   | Inches. | Inches. | °                             | °                                             | °    | °     |
| 1     | 29.576                                           | 29.666                                    | 29.523  | 0.143   | 81.8                          | 86.0                                          | 80.0 | 6.0   |
| 2     | .641                                             | .686                                      | .583    | .103    | 82.5                          | 89.5                                          | 79.0 | 10.5  |
| 3     | .617                                             | .672                                      | .540    | .132    | 83.6                          | 89.5                                          | 78.6 | 10.9  |
| 4     | .551                                             | .607                                      | .468    | .139    | 84.5                          | 92.0                                          | 80.5 | 11.5  |
| 5     | .521                                             | .565                                      | .457    | .108    | 82.3                          | 85.5                                          | 80.0 | 5.5   |
| 6     | .560                                             | .617                                      | .503    | .144    | 81.2                          | 84.2                                          | 79.5 | 4.7   |
| 7     | .625                                             | .689                                      | .576    | .113    | 81.3                          | 83.5                                          | 80.0 | 3.5   |
| 8     | .690                                             | .743                                      | .646    | .097    | 82.7                          | 86.8                                          | 79.5 | 7.3   |
| 9     | .714                                             | .755                                      | .663    | .092    | 83.3                          | 86.3                                          | 82.0 | 4.3   |
| 10    | .705                                             | .779                                      | .646    | .133    | 80.9                          | 85.2                                          | 77.4 | 5.8   |
| 11    | .713                                             | .774                                      | .666    | .108    | 80.2                          | 83.9                                          | 76.6 | 7.3   |
| 12    | .756                                             | .798                                      | .717    | .081    | 79.5                          | 83.4                                          | 77.0 | 6.4   |
| 13    | .717                                             | .763                                      | .655    | .108    | 80.2                          | 83.9                                          | 77.2 | 6.7   |
| 14    | .667                                             | .728                                      | .609    | .119    | 82.1                          | 88.0                                          | 78.6 | 9.4   |
| 15    | .657                                             | .709                                      | .589    | .120    | 83.3                          | 89.5                                          | 79.0 | 10.5  |
| 16    | .662                                             | .719                                      | .607    | .112    | 84.2                          | 90.8                                          | 80.8 | 10.0  |
| 17    | .679                                             | .720                                      | .625    | .095    | 84.9                          | 89.5                                          | 82.0 | 7.5   |
| 18    | .678                                             | .729                                      | .627    | .102    | 83.3                          | 90.0                                          | 79.5 | 10.5  |
| 19    | .676                                             | .735                                      | .592    | .143    | 84.0                          | 90.5                                          | 79.0 | 11.5  |
| 20    | .654                                             | .724                                      | .585    | .139    | 83.0                          | 90.7                                          | 80.6 | 10.7  |
| 21    | .678                                             | .737                                      | .604    | .133    | 86.5                          | 92.3                                          | 82.5 | 9.8   |
| 22    | .681                                             | .734                                      | .590    | .135    | 86.6                          | 91.5                                          | 83.0 | 8.5   |
| 23    | .666                                             | .725                                      | .610    | .115    | 83.8                          | 88.3                                          | 81.4 | 6.9   |
| 24    | .642                                             | .695                                      | .566    | .129    | 85.3                          | 90.0                                          | 81.5 | 8.5   |
| 25    | .629                                             | .689                                      | .561    | .128    | 86.1                          | 92.3                                          | 82.2 | 10.1  |
| 26    | .630                                             | .710                                      | .556    | .154    | 85.5                          | 90.0                                          | 82.5 | 7.5   |
| 27    | .606                                             | .655                                      | .542    | .113    | 85.7                          | 91.8                                          | 81.5 | 10.3  |
| 28    | .545                                             | .604                                      | .468    | .136    | 83.2                          | 89.0                                          | 80.0 | 9.0   |
| 29    | .489                                             | .533                                      | .426    | .107    | 82.7                          | 83.5                                          | 79.5 | 9.0   |
| 30    | .537                                             | .600                                      | .484    | .116    | 83.0                          | 87.6                                          | 80.2 | 7.4   |
| 31    | .570                                             | .618                                      | .507    | .111    | 84.3                          | 90.5                                          | 81.0 | 9.5   |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of August 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 79.9                            | 1.9                 | 78.6                | 3.2                          | 0.958                            | 10.32                                            | 1.08                                                                | 0.91                                                                |
| 2     | 80.3                            | 2.2                 | 78.8                | 3.7                          | .964                             | .36                                              | .28                                                                 | .89                                                                 |
| 3     | 80.5                            | 3.1                 | 78.3                | 5.3                          | .949                             | .18                                              | .85                                                                 | .85                                                                 |
| 4     | 81.0                            | 3.5                 | 78.5                | 6.0                          | .955                             | .23                                              | 2.12                                                                | .83                                                                 |
| 5     | 80.1                            | 2.2                 | 78.6                | 3.7                          | .958                             | .30                                              | 1.28                                                                | .89                                                                 |
| 6     | 79.6                            | 1.6                 | 78.5                | 2.7                          | .955                             | .29                                              | 0.92                                                                | .92                                                                 |
| 7     | 79.6                            | 1.7                 | 78.4                | 2.9                          | .952                             | .25                                              | .99                                                                 | .91                                                                 |
| 8     | 80.0                            | 2.7                 | 78.1                | 4.6                          | .943                             | .12                                              | 1.60                                                                | .86                                                                 |
| 9     | 81.1                            | 2.2                 | 79.6                | 3.7                          | .989                             | .60                                              | .33                                                                 | .89                                                                 |
| 10    | 78.9                            | 2.0                 | 77.5                | 3.4                          | .925                             | 9.98                                             | .12                                                                 | .90                                                                 |
| 11    | 79.0                            | 1.2                 | 78.2                | 2.0                          | .946                             | 10.21                                            | 0.67                                                                | .94                                                                 |
| 12    | 78.2                            | 1.3                 | 77.3                | 2.2                          | .919                             | 9.94                                             | .72                                                                 | .93                                                                 |
| 13    | 78.9                            | 1.3                 | 78.0                | 2.2                          | .940                             | 10.15                                            | .73                                                                 | .93                                                                 |
| 14    | 79.7                            | 2.4                 | 78.0                | 4.1                          | .940                             | .11                                              | 1.40                                                                | .88                                                                 |
| 15    | 80.2                            | 3.1                 | 78.0                | 5.3                          | .940                             | .09                                              | .84                                                                 | .85                                                                 |
| 16    | 80.5                            | 3.7                 | 77.9                | 6.3                          | .937                             | .04                                              | 2.20                                                                | .82                                                                 |
| 17    | 81.6                            | 3.3                 | 79.3                | 5.6                          | .979                             | .46                                              | .03                                                                 | .84                                                                 |
| 18    | 80.2                            | 3.1                 | 78.0                | 5.3                          | .940                             | .09                                              | 1.84                                                                | .85                                                                 |
| 19    | 80.6                            | 3.4                 | 78.2                | 5.8                          | .946                             | .13                                              | 2.04                                                                | .83                                                                 |
| 20    | 81.3                            | 2.6                 | 79.5                | 4.4                          | .986                             | .67                                              | 1.56                                                                | .87                                                                 |
| 21    | 82.9                            | 3.6                 | 80.7                | 5.8                          | 1.024                            | .91                                              | 2.19                                                                | .83                                                                 |
| 22    | 82.1                            | 3.9                 | 79.4                | 6.6                          | 0.983                            | .47                                              | .44                                                                 | .81                                                                 |
| 23    | 81.0                            | 2.8                 | 79.0                | 4.8                          | .970                             | .40                                              | 1.70                                                                | .86                                                                 |
| 24    | 81.6                            | 3.7                 | 79.0                | 6.3                          | .970                             | .37                                              | 2.27                                                                | .82                                                                 |
| 25    | 81.9                            | 4.2                 | 79.0                | 7.1                          | .970                             | .35                                              | .60                                                                 | .80                                                                 |
| 26    | 81.9                            | 3.6                 | 79.4                | 6.1                          | .983                             | .49                                              | .23                                                                 | .83                                                                 |
| 27    | 81.9                            | 3.8                 | 79.2                | 6.5                          | .976                             | .41                                              | .39                                                                 | .81                                                                 |
| 28    | 80.7                            | 2.5                 | 78.9                | 4.3                          | .967                             | .39                                              | 1.50                                                                | .87                                                                 |
| 29    | 80.6                            | 2.1                 | 79.1                | 3.6                          | .973                             | .45                                              | .27                                                                 | .89                                                                 |
| 30    | 81.2                            | 1.8                 | 79.9                | 3.1                          | .998                             | .72                                              | .10                                                                 | .91                                                                 |
| 31    | 81.8                            | 2.5                 | 80.0                | 4.3                          | 1.001                            | .72                                              | .56                                                                 | .87                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of August 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 29.654                                          | 29.767                                                       | 29.514  | 0.253   | 81.4                          | 85.0                                                             | 77.6 | 7.4   |
| 1              | .644                                            | .746                                                         | .507    | .239    | 81.2                          | 85.0                                                             | 77.3 | 7.7   |
| 2              | .633                                            | .735                                                         | .502    | .233    | 80.9                          | 83.5                                                             | 77.2 | 6.3   |
| 3              | .622                                            | .725                                                         | .483    | .242    | 80.8                          | 83.3                                                             | 77.2 | 6.1   |
| 4              | .615                                            | .717                                                         | .472    | .245    | 80.7                          | 83.5                                                             | 77.2 | 6.3   |
| 5              | .627                                            | .751                                                         | .482    | .269    | 80.6                          | 83.0                                                             | 77.0 | 6.0   |
| 6              | .641                                            | .766                                                         | .498    | .268    | 80.6                          | 83.0                                                             | 77.2 | 5.8   |
| 7              | .657                                            | .780                                                         | .513    | .267    | 81.0                          | 83.5                                                             | 77.5 | 6.0   |
| 8              | .670                                            | .782                                                         | .525    | .257    | 82.3                          | 85.0                                                             | 77.8 | 7.2   |
| 9              | .681                                            | .788                                                         | .533    | .255    | 83.5                          | 87.0                                                             | 77.4 | 9.6   |
| 10             | .683                                            | .798                                                         | .533    | .265    | 84.8                          | 89.0                                                             | 78.0 | 11.0  |
| 11             | .676                                            | .798                                                         | .518    | .280    | 85.8                          | 90.5                                                             | 79.4 | 11.1  |
| Noon.          | .661                                            | .790                                                         | .508    | .282    | 86.2                          | 91.0                                                             | 78.5 | 12.5  |
| 1              | .639                                            | .761                                                         | .476    | .285    | 86.8                          | 92.0                                                             | 78.5 | 13.5  |
| 2              | .613                                            | .745                                                         | .455    | .290    | 86.8                          | 92.3                                                             | 79.0 | 13.3  |
| 3              | .594                                            | .736                                                         | .432    | .304    | 86.8                          | 92.0                                                             | 79.3 | 12.7  |
| 4              | .580                                            | .721                                                         | .426    | .295    | 86.6                          | 92.3                                                             | 79.7 | 12.6  |
| 5              | .578                                            | .726                                                         | .431    | .295    | 85.3                          | 91.3                                                             | 80.0 | 11.3  |
| 6              | .588                                            | .734                                                         | .438    | .296    | 84.2                          | 88.5                                                             | 78.2 | 10.3  |
| 7              | .607                                            | .744                                                         | .455    | .289    | 83.3                          | 86.6                                                             | 78.0 | 8.6   |
| 8              | .630                                            | .748                                                         | .480    | .268    | 82.9                          | 86.0                                                             | 78.6 | 7.4   |
| 9              | .651                                            | .760                                                         | .502    | .258    | 82.4                          | 85.8                                                             | 76.6 | 9.2   |
| 10             | .667                                            | .767                                                         | .516    | .251    | 82.0                          | 85.7                                                             | 76.8 | 8.9   |
| 11             | .665                                            | .774                                                         | .519    | .255    | 81.7                          | 85.0                                                             | 77.8 | 7.2   |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of August 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 79.8                            | 1.6                 | 78.7                | 2.7                          | .961                             | 10.35                                            | 0.92                                                                | 0.92                                                                |
| 1              | 79.7                            | 1.5                 | 78.6                | 2.6                          | .958                             | .32                                              | .89                                                                 | .92                                                                 |
| 2              | 79.6                            | 1.3                 | 78.7                | 2.2                          | .961                             | .37                                              | .73                                                                 | .93                                                                 |
| 3              | 79.5                            | 1.3                 | 78.6                | 2.2                          | .958                             | .34                                              | .73                                                                 | .93                                                                 |
| 4              | 79.5                            | 1.2                 | 78.7                | 2.0                          | .961                             | .37                                              | .67                                                                 | .94                                                                 |
| 5              | 79.5                            | 1.1                 | 78.7                | 1.9                          | .961                             | .37                                              | .64                                                                 | .94                                                                 |
| 6              | 79.5                            | 1.1                 | 78.7                | 1.9                          | .961                             | .37                                              | .64                                                                 | .94                                                                 |
| 7              | 79.8                            | 1.2                 | 79.0                | 2.0                          | .970                             | .46                                              | .68                                                                 | .94                                                                 |
| 8              | 80.4                            | 1.9                 | 79.1                | 3.2                          | .973                             | .47                                              | 1.11                                                                | .90                                                                 |
| 9              | 80.6                            | 2.9                 | 78.6                | 4.9                          | .958                             | .28                                              | .72                                                                 | .86                                                                 |
| 10             | 81.2                            | 3.6                 | 78.7                | 6.1                          | .961                             | .29                                              | 2.17                                                                | .83                                                                 |
| 11             | 81.3                            | 4.5                 | 78.1                | 7.7                          | .943                             | .06                                              | .77                                                                 | .78                                                                 |
| Noon.          | 81.6                            | 4.6                 | 78.4                | 7.8                          | .952                             | .15                                              | .84                                                                 | .78                                                                 |
| 1              | 81.9                            | 4.9                 | 79.0                | 7.8                          | .970                             | .33                                              | .88                                                                 | .78                                                                 |
| 2              | 82.1                            | 4.7                 | 79.3                | 7.5                          | .970                             | .42                                              | .79                                                                 | .79                                                                 |
| 3              | 82.1                            | 4.7                 | 79.3                | 7.5                          | .979                             | .42                                              | .79                                                                 | .79                                                                 |
| 4              | 81.7                            | 4.9                 | 78.8                | 7.8                          | .964                             | .27                                              | .87                                                                 | .78                                                                 |
| 5              | 81.5                            | 3.8                 | 78.8                | 6.5                          | .964                             | .29                                              | .35                                                                 | .81                                                                 |
| 6              | 81.1                            | 3.1                 | 78.9                | 5.3                          | .967                             | .37                                              | 1.87                                                                | .85                                                                 |
| 7              | 80.8                            | 2.5                 | 79.0                | 4.3                          | .970                             | .42                                              | .51                                                                 | .87                                                                 |
| 8              | 80.7                            | 2.2                 | 79.2                | 3.7                          | .976                             | .48                                              | .31                                                                 | .89                                                                 |
| 9              | 80.4                            | 2.0                 | 79.0                | 3.4                          | .970                             | .44                                              | .17                                                                 | .90                                                                 |
| 10             | 80.2                            | 1.8                 | 78.9                | 3.1                          | .967                             | .41                                              | .06                                                                 | .91                                                                 |
| 11             | 80.0                            | 1.7                 | 78.8                | 2.9                          | .964                             | .38                                              | 0.99                                                                | .91                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of August 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                                                         |
|-------|-----------------------|---------------------------------|-----------------------|---------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                                                    |
|       | °                     | Inches                          |                       | lb            | Miles           |                                                                                                                                                    |
| 1     | 139.0                 | 0.74                            | SS W, SE & SSE        | 1.2           | 77.4            | O to 10 A. M. S to 11 P. M. Slight R at after intervals.                                                                                           |
| 2     | 139.8                 | 0.08                            | SE & ESE              | ...           | 178.9           | O to 5 P. M., Vi to 9 A. M. Vi to 1 P. M., O to 5 P. M., Vi to 9 P. M., B to 11 P. M. T between 2 & 3 P. M. Light R at 12½ A. M. 1½, 2½ & 3½ P. M. |
| 3     | 145.0                 | 0.13                            | SSE & SE              | ...           | 97.0            | B to 2 A. M. Vi to 4 A. M., Vi to 7 A. M. Vi to 5 P. M., Vi to 11 P. M. T at 4½ & 5½ P. M. L between 7 & 8 P. M. Slight R at 4½ A. M. 3 & 4 P. M.  |
| 4     | 141.0                 | 0.07                            | SSE, SE & E by S      | 0.8           | 72.4            | Vi to 2 A. M., Vi to 6 A. M. Vi to 11 P. M. T at 4½ P. M. Light R at 3½ & 4½ P. M.                                                                 |
| 5     | 139.0                 | 0.11                            | SE & E                | 0.6           | 154.8           | S to 8 A. M., Vi to 11 P. M. Light R after intervals, after 9 A. M.                                                                                |
| 6     | ...                   | 0.34                            | SE & S                | 1.9           | 230.5           | O to 4 P. M. S to 8 P. M., Vi to 11 P. M. Slight R at after intervals from 2 A. M. to 1½ P. M.                                                     |
| 7     | ...                   | 0.05                            | S & SSE               | ...           | 170.0           | Vi to 5 A. M. O to 4 P. M., Vi to 11 P. M. Light R at 5½, 6½, 10 & 11 A. M.                                                                        |
| 8     | 129.0                 | ...                             | SSE & SS W            | ...           | 122.0           | S to 6 P. M., Vi to 11 P. M. D at 8 A. M.                                                                                                          |
| 9     | 125.5                 | ...                             | SS W & S              | ...           | 191.1           | O. D at 1, 8, 11½ A. M. & 6 P. M.                                                                                                                  |
| 10    | ...                   | 0.32                            | S & SS W              | ...           | 177.2           | O to 6 P. M. S. to 11 P. M. L. from 8 to 10 P. M. Slight R from 6½ to 12 A. M.                                                                     |
| 11    | ...                   | 1.12                            | SS W & S              | ...           | 107.1           | O to 4 P. M. S to 7 P. M. O to 11 P. M. T at 11½ A. M. & 8 P. M. L at 8 P. M. R from 10½ A. M. to 4 & 8 to 11 P. M.                                |
| 12    | ...                   | *1.61                           | S W & SS W            | 0.8           | 91.2            | O. Slight R from midnight to 7, 11 A. M. to 2 & at 6 P. M.                                                                                         |

Vi Cirri,—i Strati, Vi Cumuli, Vi Cirro-strati, Vi Cumulo-strati, Vi Nimib, Vi Cirro-cumuli, B clear, S stratoni. O overcast, T thunder, L lightning, R rain, D drizzle.

\*Feel since 8 P. M., of the 11th

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of August 1873.*

## Solar Radiation. Weather, &amp;c.

| Date. | Max. Solar radiation. | Rain Gauge<br>1½ ft. above<br>Ground. | WIND.                 |                |                             | General aspect of the Sky.                                                                                                       |
|-------|-----------------------|---------------------------------------|-----------------------|----------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                       | Prevailing direction. | Max. Pressure. | Daily Velocity.             |                                                                                                                                  |
|       |                       | Inches                                |                       | lb             | Mile.                       |                                                                                                                                  |
| 13    | ...                   | 1.27                                  | S S W & S by W        | ...            | 83.2                        | O to 5 P. M. clouds of different kinds to 11 P. M. R from 3½ to 8 A. M. D from 9 A. M. to 4 P. M. & at 10½ P. M.                 |
| 14    | 140.0                 | 0.70                                  | W N W; S W & S        | ...            | 41.5                        | O to 5 A. M., ½ to 8 A. M. O to 10 A. M. ½ to 7 P. M., ½ to 11 P. M., Slight R at 10 A. M. 5½, 6½, 8 & 11 P. M.                  |
| 15    | 142.5                 | 0.11                                  | S by E & W S W        | ...            | Anemometer was out of order | O to 3 A. M., ½ to 1 P. M. ½ to 4 P. M. O to 11 P. M. L at 11 P. M. Light R between midnight & 1 at 1½, 2½ A. M., 7 & 10 P. M.   |
| 16    | 145.0                 | 0.07                                  | W S W & S W           | ...            |                             | Clouds of different kinds. L at midnight, 7 & 8 P. M. Slight R at 5½ A. M., & 10 P. M.                                           |
| 17    | 149.0                 | ...                                   | W S W & S S W         | ...            |                             | O to 6 A. M., ½ to 4 P. M. O to 8 P. M. S to 11 P. M. T at 6 P. M. L at 7 P. M.                                                  |
| 18    | 142.0                 | 0.10                                  | S S W & S W           | ...            |                             | O to 8 A. M., ½ to 7 P. M. S to 11 P. M. T between 4 & 5 P. M. L at 10 & 11 P. M. Light R at 1, 2, 3, 7 A. M. 4, 5, 6 & 8½ P. M. |
| 19    | 144.0                 | 0.93                                  | S S W & S by W        | ...            |                             | ½ to 2 A. M., ½ to 9 A. M., ½ to 3 P. M. O to 11 P. M. L at midnight & 1 A. M., & from 7 to 10 P. M. T & R from 6½ to 11 P. M.   |
| 20    | 146.0                 | 0.37                                  | S E & S               | 0.8            |                             | S to 5 A. M., ½ to 9 A. M., ½ to 2 P. M. O to 7 P. M. B to 11 P. M. L at midnight. T & R between 3 & 4 P. M.                     |
| 21    | 140.5                 | ...                                   | S by W & S S E        | ...            |                             | S to 6 A. M., ½ to 7 P. M. S to 11 P. M. L on S from 7 to 10 P. M.                                                               |
| 22    | 145.2                 | ...                                   | S by E & S by W       | ...            |                             | S to 1 A. M. B to 5 A. M., ½ to 7 P. M. B to 11 P. M.                                                                            |

½ Cirri, — i Strati, ½ Cumuli, ½ Cirro-strati, ½ Cumulo-strati, ½ Nimbi,  
½ Cirro-cumuli, B clear, S strati, O overcast, T thunder, L lightning  
R. rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of August 1873.*

Solar Radiation, Weather, &c.,

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |                |                 | General aspect of the Sky.                                                                                                                                                                                       |
|-------|-----------------------|---------------------------------|-----------------------|----------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure. | Daily Velocity. |                                                                                                                                                                                                                  |
|       | °                     | Inches                          |                       |                |                 |                                                                                                                                                                                                                  |
| 23    | 134.5                 | 0.04                            | S by E & E S E        | ...            | 109.0           | B to 2 A. M., $\sim$ i to 7 A. M., $\sim$ i to 2 P. M. O to 4 P. M. S to 11 P. M. T at 2½ P. M. Light R at 12½ A. M. 3 & 4½ P. M.                                                                                |
| 24    | 140.0                 | ...                             | E S E & N E           | ...            | 70.0            | $\sim$ i to 6 A. M., $\sim$ i & $\sim$ i to 12 A. M. S to 2 P. M., $\sim$ i to 6 P. M. $\sim$ i to 11 P. M. L from 7 to 11 P. M.                                                                                 |
| 25    | 142.0                 | 0.14                            | E S E & S W           | ...            | 104.4           | $\sim$ i to 1 A. M. B to 5 A. M., $\sim$ i to 8 A. M., $\sim$ i to 7 P. M., $\sim$ i to 11 P. M. L at midnight & 1 A. M. Slight R at 5 & 7½ P. M.                                                                |
| 26    | 146.0                 | 0.04                            | S W & E by S          | ...            | 86.3            | B to 4 A. M. S to 10 A. M., $\sim$ i to 7 P. M. B to 11 P. M. Light R at 1½ & 2½ P. M.                                                                                                                           |
| 27    | 141.5                 | ...                             | S E, E & S by E       | ...            | 147.4           | B to 3 A. M., $\sim$ i to 6 A. M. S to 9 A. M., $\sim$ i to 8 P. M. B to 11 P. M. L on W at 7½ P. M. T & D between 5 & 6 P. M.                                                                                   |
| 28    | 133.2                 | 0.31                            | E by S & E            | 1.3            | 172.9           | Chiefly S. Slight R from 1½ to 3, at 6 & 9½ P. M.                                                                                                                                                                |
| 29    | 132.0                 | 0.70                            | E & S E               | 5.6            | 222.6           | Chiefly O. Brisk wind from 2½ to 6 P. M. T between 11 & 12 A. M. L on W at 11 P. M. Slight R after intervals.                                                                                                    |
| 30    | 133.3                 | 0.40                            | S W & S S W           | ...            | 240.2           | O to 2 P. M., $\sim$ i to 9 P. M., B to 11 P. M. L from midnight to 4 A. M. Slight R at 1½, 3½, 4½, 9 A. M., 1 & 4½ P. M.                                                                                        |
| 31    | 143.0                 | 0.18                            | S S W & S S E         | 1.2            | 107.6           | B to 3 A. M. S to 5 A. M., $\sim$ i to 9 A. M., $\sim$ i to 1 P. M. O to 5 P. M., $\sim$ i to 9 P. M., $\sim$ i to 11 P. M. T at 1 P. M. L from midnight to 2 A. M. & at 11½ P. M. R between 1 & 2 & 5 & 6 P. M. |

$\sim$  i Cirri — i Strati,  $\sim$  i Cumuli,  $\sim$  i Cirro-strati,  $\sim$  i Cumulo-strati  $\sim$  i Nimbi,  $\sim$  i Cirro-Cumuli. B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of August 1873.*

## MONTHLY RESULTS.

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|                                                                        | Inches. |
|------------------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..                      | 29.637  |
| Max. height of the Barometer occurred at 10 and 11 A.M. on the 12th... | 29.798  |
| Min. height of the Barometer occurred at 4 P. M. on the 29th ...       | 29.426  |
| Extreme range of the Barometer during the month ... ..                 | 0.372   |
| Mean of the daily Max. Pressures ... ..                                | 29.694  |
| Ditto ditto Min. ditto ... ..                                          | 29.574  |
| Mean daily range of the Barometer during the month ... ..              | 0.120   |

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|                                                                   | °    |
|-------------------------------------------------------------------|------|
| Mean Dry Bulb Thermometer for the month ... ..                    | 83.3 |
| Max. Temperature occurred at 2 & 4 P. M. on the 21st and 25th ... | 92.3 |
| Min. Temperature occurred at 9 P. M. on the 11th ... ..           | 76.6 |
| Extreme range of the Temperature during the month ... ..          | 15.7 |
| Mean of the daily Max. Temperature ... ..                         | 88.3 |
| Ditto ditto Min. ditto, ... ..                                    | 80.0 |
| Mean daily range of the Temperature during the month ... ..       | 8.3  |

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|                                                                |      |
|----------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..                 | 80.6 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ...  | 2.7  |
| Computed Mean Dew-point for the month ... ..                   | 78.7 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ... .. | 4.6  |

|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.961   |

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|                                                                        | Troy grain. |
|------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                             | 10.31       |
| Additional Weight of Vapour required for complete saturation ...       | 1.62        |
| Mean degree of humidity for the month, complete saturation being unity | 0.86        |

|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 139.9 |

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|                                                                                                      | Inches. |
|------------------------------------------------------------------------------------------------------|---------|
| Rained 27 days,—Max. fall of rain during 24 hours ... ..                                             | 1.27    |
| Total amount of rain during the month ... ..                                                         | 10.23   |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month ... .. | 9.84.   |
| Prevailing direction of the Wind ... .. S. S. W & S. E.                                              |         |

\* Height 70 feet 10 inches above ground.

*Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of August 1873.*

MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

| Hour.     | N. by E. | N. E. | N. N. E. | E. by N. | E. | E. by S. | E. S. E. | S. E. | S. S. E. | S. by E. | S.           | S. by W. | S. S. W. | S. W. | W. S. W. | W. by S. | W. S. | W. by N. | W. N. W. | N. W. | N. N. W. | N. by W. | N. W. |
|-----------|----------|-------|----------|----------|----|----------|----------|-------|----------|----------|--------------|----------|----------|-------|----------|----------|-------|----------|----------|-------|----------|----------|-------|
| Mid night |          |       |          |          |    |          |          |       |          |          | No. of days. |          |          |       |          |          |       |          |          |       |          |          |       |
| 1         | 1        | 1     |          |          |    |          | 3        | 5     | 3        | 4        | 1            | 2        | 1        | 7     | 2        | 1        |       |          |          |       |          |          |       |
| 2         | 1        | 1     |          |          |    |          | 3        | 5     | 3        | 3        | 1            | 2        | 1        | 7     | 1        | 1        |       |          |          |       |          |          |       |
| 3         | 1        | 1     |          |          |    |          | 4        | 5     | 3        | 3        | 1            | 1        | 1        | 7     | 1        | 1        |       |          |          |       |          |          |       |
| 4         | 1        | 1     |          |          |    |          | 4        | 5     | 3        | 3        | 1            | 1        | 1        | 7     | 1        | 1        |       |          |          |       |          |          |       |
| 5         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 6         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 7         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 8         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 9         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 10        | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 11        | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| Noon.     |          |       |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 1         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 2         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 3         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 4         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 5         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 6         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 7         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 8         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 9         | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 10        | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |
| 11        | 1        | 1     |          |          |    |          | 3        | 5     | 2        | 2        | 1            | 2        | 1        | 5     | 1        | 1        |       |          |          |       |          |          |       |



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of September 1873.*

Latitude  $22^{\circ} 33' 1''$  North. Longitude  $88^{\circ} 20' 34''$  East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Menus, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at 32° Fahr. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|-------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                 | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                         | Inches.                                   | Inches. | Inches. | °                             | °                                             | °    | °     |
| 1     | 29.564                                          | 29.613                                    | 29.507  | 0.106   | 83.9                          | 89.3                                          | 81.0 | 8.3   |
| 2     | .589                                            | .642                                      | .529    | .113    | 83.0                          | 89.0                                          | 80.0 | 9.0   |
| 3     | .567                                            | .620                                      | .482    | .147    | 81.0                          | 89.5                                          | 79.5 | 10.0  |
| 4     | .504                                            | .554                                      | .429    | .121    | 83.4                          | 88.0                                          | 80.0 | 8.0   |
| 5     | .517                                            | .580                                      | .446    | .134    | 82.7                          | 89.0                                          | 80.0 | 9.0   |
| 6     | .581                                            | .652                                      | .527    | .125    | 78.6                          | 80.5                                          | 76.5 | 4.0   |
| 7     | .660                                            | .711                                      | .612    | .099    | 82.0                          | 86.8                                          | 78.0 | 8.8   |
| 8     | .698                                            | .740                                      | .649    | .091    | 85.0                          | 90.0                                          | 80.5 | 9.5   |
| 9     | .691                                            | .741                                      | .631    | .110    | 86.0                          | 90.0                                          | 82.2 | 7.8   |
| 10    | .646                                            | .696                                      | .557    | .139    | 85.0                          | 91.0                                          | 80.5 | 10.5  |
| 11    | .627                                            | .684                                      | .549    | .135    | 84.6                          | 91.2                                          | 82.0 | 9.2   |
| 12    | .554                                            | .627                                      | .469    | .158    | 82.1                          | 86.5                                          | 80.0 | 6.5   |
| 13    | .599                                            | .666                                      | .525    | .141    | 81.7                          | 87.8                                          | 79.0 | 8.8   |
| 14    | .658                                            | .703                                      | .605    | .098    | 81.3                          | 86.2                                          | 79.5 | 6.7   |
| 15    | .729                                            | .795                                      | .662    | .133    | 83.5                          | 89.5                                          | 79.3 | 10.2  |
| 16    | .782                                            | .850                                      | .709    | .141    | 84.9                          | 90.5                                          | 80.0 | 10.5  |
| 17    | .802                                            | .872                                      | .742    | .130    | 84.0                          | 87.6                                          | 82.0 | 5.6   |
| 18    | .783                                            | .856                                      | .721    | .135    | 84.6                          | 89.5                                          | 80.3 | 9.2   |
| 19    | .759                                            | .808                                      | .680    | .128    | 84.8                          | 89.8                                          | 81.0 | 8.8   |
| 20    | .708                                            | .769                                      | .643    | .126    | 85.0                          | 91.0                                          | 81.5 | 9.5   |
| 21    | .666                                            | .716                                      | .610    | .106    | 86.1                          | 90.8                                          | 82.4 | 8.4   |
| 22    | .639                                            | .690                                      | .588    | .102    | 86.6                          | 92.0                                          | 82.0 | 10.0  |
| 23    | .644                                            | .689                                      | .595    | .094    | 86.8                          | 92.5                                          | 82.5 | 10.0  |
| 24    | .682                                            | .732                                      | .636    | .096    | 87.0                          | 93.0                                          | 82.5 | 10.5  |
| 25    | .707                                            | .762                                      | .658    | .104    | 83.7                          | 87.5                                          | 81.5 | 6.0   |
| 26    | .718                                            | .772                                      | .665    | .107    | 85.8                          | 92.0                                          | 81.0 | 11.0  |
| 27    | .727                                            | .792                                      | .668    | .124    | 86.6                          | 92.8                                          | 82.2 | 10.6  |
| 28    | .711                                            | .755                                      | .647    | .108    | 86.5                          | 92.5                                          | 82.5 | 10.0  |
| 29    | .739                                            | .816                                      | .683    | .133    | 86.6                          | 93.6                                          | 81.5 | 12.1  |
| 30    | .791                                            | .859                                      | .736    | .123    | 84.6                          | 91.5                                          | 81.0 | 10.5  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of September 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete sat-<br>uration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | o                               | o                   | o                   | o                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 81.4                            | 2.5                 | 79.6                | 4.3                          | 0.989                            | 10.60                                            | 1.53                                                                | 0.87                                                                |
| 2     | 80.6                            | 2.4                 | 78.9                | 4.1                          | .967                             | .39                                              | .43                                                                 | .88                                                                 |
| 3     | 81.1                            | 2.9                 | 79.1                | 4.9                          | .973                             | .42                                              | .75                                                                 | .86                                                                 |
| 4     | 81.3                            | 2.1                 | 79.8                | 3.6                          | .905                             | .66                                              | .30                                                                 | .89                                                                 |
| 5     | 80.5                            | 2.2                 | 79.0                | 3.7                          | .970                             | .42                                              | .30                                                                 | .89                                                                 |
| 6     | 77.7                            | 0.9                 | 77.1                | 1.5                          | .913                             | 9.88                                             | 0.50                                                                | .95                                                                 |
| 7     | 79.6                            | 2.4                 | 77.9                | 4.1                          | .937                             | 10.08                                            | 1.39                                                                | .88                                                                 |
| 8     | 81.0                            | 4.0                 | 78.2                | 6.8                          | .946                             | .11                                              | 2.42                                                                | .81                                                                 |
| 9     | 81.7                            | 4.3                 | 78.7                | 7.3                          | .961                             | .26                                              | .65                                                                 | .80                                                                 |
| 10    | 81.7                            | 3.3                 | 79.4                | 5.6                          | .983                             | .49                                              | .04                                                                 | .84                                                                 |
| 11    | 81.9                            | 2.7                 | 80.0                | 4.6                          | 1.001                            | .70                                              | 1.69                                                                | .86                                                                 |
| 12    | 80.1                            | 2.0                 | 78.7                | 3.4                          | 0.961                            | .35                                              | .16                                                                 | .90                                                                 |
| 13    | 79.6                            | 2.1                 | 78.1                | 3.6                          | .943                             | .14                                              | .23                                                                 | .89                                                                 |
| 14    | 79.6                            | 1.7                 | 78.4                | 2.9                          | .952                             | .25                                              | 0.99                                                                | .91                                                                 |
| 15    | 81.1                            | 2.4                 | 79.4                | 4.1                          | .983                             | .54                                              | 1.46                                                                | .88                                                                 |
| 16    | 81.8                            | 3.1                 | 79.6                | 5.3                          | .989                             | .58                                              | .91                                                                 | .85                                                                 |
| 17    | 81.4                            | 2.6                 | 79.6                | 4.4                          | .989                             | .60                                              | .57                                                                 | .87                                                                 |
| 18    | 81.0                            | 3.6                 | 78.5                | 6.1                          | .955                             | .23                                              | 2.16                                                                | .83                                                                 |
| 19    | 81.3                            | 3.5                 | 78.8                | 6.0                          | .964                             | .31                                              | .15                                                                 | .83                                                                 |
| 20    | 81.5                            | 3.5                 | 79.0                | 6.0                          | .970                             | .37                                              | .16                                                                 | .83                                                                 |
| 21    | 81.8                            | 4.3                 | 78.8                | 7.3                          | .964                             | .29                                              | .66                                                                 | .80                                                                 |
| 22    | 81.1                            | 5.5                 | 77.8                | 8.8                          | .934                             | 9.95                                             | 3.19                                                                | .76                                                                 |
| 23    | 81.9                            | 4.9                 | 79.0                | 7.8                          | .970                             | 10.33                                            | 2.88                                                                | .78                                                                 |
| 24    | 81.4                            | 5.6                 | 78.0                | 9.0                          | .940                             | .01                                              | 3.28                                                                | .75                                                                 |
| 25    | 80.7                            | 3.0                 | 78.6                | 5.1                          | .958                             | .28                                              | 1.79                                                                | .85                                                                 |
| 26    | 80.9                            | 4.9                 | 77.5                | 8.3                          | .925                             | 9.88                                             | 2.95                                                                | .77                                                                 |
| 27    | 81.6                            | 5.0                 | 78.6                | 8.0                          | .958                             | 10.21                                            | .93                                                                 | .78                                                                 |
| 28    | 81.1                            | 5.4                 | 77.9                | 8.6                          | .937                             | 9.98                                             | 3.12                                                                | .76                                                                 |
| 29    | 80.6                            | 6.0                 | 77.0                | 9.6                          | .910                             | .69                                              | .45                                                                 | .74                                                                 |
| 30    | 80.0                            | 4.6                 | 76.8                | 7.8                          | .905                             | .67                                              | 2.72                                                                | .78                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of September 1878.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 29.679                                          | 29.819                                                       | 29.529  | 0.290   | 82.4                          | 85.0                                                             | 79.0 | 6.0   |
| 1              | .668                                            | .807                                                         | .519    | .288    | 82.0                          | 84.7                                                             | 78.6 | 6.1   |
| 2              | .659                                            | .797                                                         | .510    | .287    | 81.7                          | 84.5                                                             | 78.2 | 6.3   |
| 3              | .650                                            | .790                                                         | .503    | .287    | 81.5                          | 84.2                                                             | 77.5 | 6.7   |
| 4              | .645                                            | .782                                                         | .490    | .292    | 81.3                          | 84.0                                                             | 77.5 | 6.5   |
| 5              | .658                                            | .788                                                         | .498    | .290    | 81.2                          | 83.7                                                             | 77.5 | 6.2   |
| 6              | .673                                            | .800                                                         | .511    | .289    | 81.1                          | 83.4                                                             | 76.5 | 6.9   |
| 7              | .687                                            | .830                                                         | .518    | .312    | 81.6                          | 84.0                                                             | 77.2 | 6.8   |
| 8              | .708                                            | .858                                                         | .525    | .333    | 83.3                          | 85.7                                                             | 77.5 | 8.2   |
| 9              | .720                                            | .872                                                         | .550    | .322    | 85.1                          | 87.7                                                             | 78.0 | 9.7   |
| 10             | .719                                            | .861                                                         | .541    | .323    | 86.5                          | 89.5                                                             | 78.0 | 11.5  |
| 11             | .707                                            | .852                                                         | .529    | .323    | 87.5                          | 91.2                                                             | 78.5 | 12.7  |
| Noon.          | .689                                            | .825                                                         | .513    | .312    | 88.2                          | 92.1                                                             | 78.0 | 14.1  |
| 1              | .662                                            | .787                                                         | .489    | .298    | 88.7                          | 92.5                                                             | 77.5 | 15.0  |
| 2              | .637                                            | .771                                                         | .460    | .311    | 88.7                          | 93.6                                                             | 77.7 | 15.9  |
| 3              | .618                                            | .753                                                         | .429    | .324    | 87.6                          | 93.0                                                             | 78.1 | 14.6  |
| 4              | .611                                            | .748                                                         | .410    | .308    | 87.3                          | 92.5                                                             | 79.5 | 13.0  |
| 5              | .614                                            | .746                                                         | .439    | .307    | 86.5                          | 91.8                                                             | 79.3 | 12.5  |
| 6              | .625                                            | .754                                                         | .462    | .292    | 85.2                          | 89.0                                                             | 79.5 | 9.5   |
| 7              | .647                                            | .779                                                         | .486    | .293    | 84.3                          | 87.8                                                             | 80.2 | 7.6   |
| 8              | .671                                            | .799                                                         | .511    | .288    | 83.7                          | 86.6                                                             | 80.2 | 6.4   |
| 9              | .689                                            | .824                                                         | .538    | .286    | 83.3                          | 86.5                                                             | 80.0 | 6.5   |
| 10             | .699                                            | .835                                                         | .549    | .295    | 82.8                          | 86.0                                                             | 80.0 | 6.0   |
| 11             | .694                                            | .839                                                         | .536    | .303    | 82.6                          | 85.5                                                             | 79.0 | 6.5   |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of September 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 80.7                            | 1.7                 | 79.5                | 2.9                          | .986                             | 10.60                                            | 1.01                                                                | .91                                                                 |
| 1              | 80.5                            | 1.5                 | 79.4                | 2.6                          | .983                             | .56                                              | .91                                                                 | .92                                                                 |
| 2              | 80.4                            | 1.3                 | 79.5                | 2.2                          | .986                             | .62                                              | .75                                                                 | .93                                                                 |
| 3              | 80.2                            | 1.3                 | 79.3                | 2.2                          | .979                             | .55                                              | .76                                                                 | .93                                                                 |
| 4              | 80.1                            | 1.2                 | 79.3                | 2.0                          | .979                             | .55                                              | .69                                                                 | .94                                                                 |
| 5              | 80.0                            | 1.2                 | 79.2                | 2.0                          | .976                             | .52                                              | .69                                                                 | .94                                                                 |
| 6              | 79.9                            | 1.2                 | 79.1                | 2.0                          | .973                             | .49                                              | .68                                                                 | .94                                                                 |
| 7              | 80.2                            | 1.4                 | 79.2                | 2.4                          | .976                             | .52                                              | .82                                                                 | .93                                                                 |
| 8              | 80.5                            | 2.8                 | 78.5                | 4.8                          | .955                             | .25                                              | 1.68                                                                | .86                                                                 |
| 9              | 81.0                            | 4.1                 | 78.1                | 7.0                          | .943                             | .08                                              | 2.49                                                                | .80                                                                 |
| 10             | 81.5                            | 5.0                 | 78.5                | 8.0                          | .955                             | .18                                              | .92                                                                 | .78                                                                 |
| 11             | 81.6                            | 5.9                 | 78.1                | 9.4                          | .943                             | .04                                              | 3.45                                                                | .74                                                                 |
| Noon.          | 81.8                            | 6.4                 | 78.0                | 10.2                         | .940                             | 9.99                                             | .77                                                                 | .73                                                                 |
| 1              | 81.7                            | 7.0                 | 77.5                | 11.2                         | .925                             | .82                                              | 4.14                                                                | .70                                                                 |
| 2              | 81.9                            | 6.8                 | 77.8                | 10.9                         | .934                             | .91                                              | .05                                                                 | .71                                                                 |
| 3              | 81.4                            | 6.2                 | 77.7                | 9.9                          | .931                             | .90                                              | 3.62                                                                | .73                                                                 |
| 4              | 81.4                            | 5.9                 | 77.9                | 9.4                          | .937                             | .98                                              | .43                                                                 | .74                                                                 |
| 5              | 81.3                            | 5.2                 | 78.2                | 8.3                          | .946                             | 10.09                                            | .01                                                                 | .77                                                                 |
| 6              | 81.1                            | 4.1                 | 78.2                | 7.0                          | .946                             | .11                                              | 2.50                                                                | .80                                                                 |
| 7              | 81.2                            | 3.1                 | 79.0                | 5.3                          | .970                             | .40                                              | 1.88                                                                | .85                                                                 |
| 8              | 80.9                            | 2.8                 | 78.9                | 4.8                          | .967                             | .37                                              | .70                                                                 | .86                                                                 |
| 9              | 80.8                            | 2.5                 | 79.0                | 4.3                          | .970                             | .42                                              | .51                                                                 | .87                                                                 |
| 10             | 80.6                            | 2.2                 | 79.1                | 3.7                          | .973                             | .45                                              | .30                                                                 | .89                                                                 |
| 11             | 80.6                            | 2.0                 | 79.2                | 3.4                          | .976                             | .50                                              | .18                                                                 | .90                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of September 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |                               | General aspect of the Sky.                                                                                                         |
|-------|-----------------------|---------------------------------|-----------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure Daily Velocity. |                                                                                                                                    |
|       |                       | Inches.                         |                       | lb Miles                      |                                                                                                                                    |
| 1     | 136.0                 | 0.09                            | SS E & ESE            | 1.0 138.4                     | ~i to 8 A. M. ~i to 12 A. M. S to 5 P. M. ~i to 11 P. M. L on SW at Midnight, Slight R at 1½ & 4 P. M.                             |
| 2     | 133.8                 | 0.10                            | ESE & SE              | 1.6 188.2                     | Clouds of different kinds, Light R after intervals.                                                                                |
| 3     | 143.0                 | ...                             | ESE & SE              | ... 182.0                     | ~i to 1 A. M. S to 5 A. M. ~i to 8 A. M. ~i to 6 P. M. ~i to 11 P. M. D at 12½ A. M. 3½ & 11½ P. M.                                |
| 4     | 123.0                 | 0.11                            | SE & S                | ... 196.3                     | Sends to 8 A. M. ~i to 7 P. M. ~i to 11 P. M. T at 1½ & 3 P. M. Slight R at 1½ A. M. 1½, 3, 5 & 7 P. M.                            |
| 5     | 129.0                 | 0.70                            | S & ESE               | 0.8 190.7                     | ~i to 7 A. M. ~i to 1 P. M. O to 5 P. M. ~i to 9 P. M. O to 11 P. M. T between 2 & 3 P. M. R from 2½ to 3½ at 5 & 11 P. M.         |
| 6     | ...                   | 2.32                            | SSW & S by W          | 1.8 182.7                     | O. R nearly the whole day.                                                                                                         |
| 7     | 134.0                 | 0.19                            | S by W & SW           | ... 178.0                     | O to 9 A. M. ~i to 6 P. M. B to 11 P. M. T from 1 to 3 A. M. Slight R from Midnight to 3 at 7½ & 9 A. M.                           |
| 8     | 139.0                 | ...                             | SW & W by S           | ... 133.8                     | ~i to 2 A. M. ~i to 6 A. M. B to 8 A. M. ~i to 3 P. M. ~i to 11 P. M.                                                              |
| 9     | 137.8                 | ...                             | W by S & W by N       | ... 98.8                      | ~i to 12 A. M. ~i to 6 P. M. B to 8 A. M. ~i to 11 P. M. L on NE at 6½ P. M.                                                       |
| 10    | 136.5                 | 0.29                            | W by N & E by S       | 1.0 106.2                     | ~i & ~i to 8 A. M. ~i to 3 P. M. O to 11 P. M. T at 2½ & 4 P. M. L on S between 8 & 9 P. M. Slight R at 2½, 4½, 6½, 9 & 10 P. M.   |
| 11    | 133.7                 | 0.29                            | E by S & N            | ... 109.9                     | O to 1 A. M. ~i to 9 A. M. ~i to 2 P. M. O to 5 P. M. S to 8 P. M. ~i to 11 P. M. T at 3 P. M. Lat 7.8 & 11 P. M. R at 3 & 4 P. M. |

~i Cirri,—i Strati, ~i Cumuli, ~i Cirro-strati, ~i Cumulo-strati, ~i Nimbi,  
~i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning,  
R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of September 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge<br>1½ ft. above<br>Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                                                                 |
|-------|-----------------------|---------------------------------------|-----------------------|---------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                       | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                                                            |
|       | °                     | Inches                                |                       | lb            | Mile.           |                                                                                                                                                            |
| 12    | 131.0                 | 0.72                                  | E                     | 2.4           | 115.3           | S to 2 A. M. \i to 6 A. M. O to 7 P. M. S to 11 P. M. L from Midnight to 2 A. M. & at 8 P. M. R at 5½, 11½ & from 12½ A. M. to 2 P. M.                     |
| 13    | 136.0                 | 0.75                                  | E S E, S E & S S E    | 2.0           | 238.0           | Chiefly O. T between 2 & 3 P. M. R from Midnight to 3 at 8½, 9½, 11 A. M. & 2½ P. M.                                                                       |
| 14    | 120.0                 | 0.13                                  | S E & S by E          | ...           | 185.7           | S to 1 A. M. \i to 4 A. M. S to 7 A. M. \i to 1 P. M. O to 8 P. M. \i to 11 P. M. T at 11 A. M. L on S W at 4 A. M. Light R at 8½, 10½, 12 A. M. & 5 P. M. |
| 15    | 112.0                 | 0.07                                  | S by E, S S E & S S W | ...           | 119.8           | \i to 8 A. M. \i to 7 P. M. B to 11 P. M. Light R at 1½, 5, 5½ & 6½ P. M.                                                                                  |
| 16    | 147.0                 | 0.06                                  | S S W                 | ...           | 98.5            | B to 2 A. M. \i to 9 A. M. \i to 6 P. M. O to 11 P. M. T at 9 & 10 P. M. L from 7 to 10 P. M. Light R at 5½, 9 & 11 P. M.                                  |
| 17    | 139.5                 | ...                                   | S W, & S by E         | ...           | 94.1            | O to 1 A. M. \i to 5 A. M. S to 8 A. M. \i to 11 A. M. O to 3 P. M. \i to 7 P. M. B to 11 P. M. D at Midnight.                                             |
| 18    | 140.2                 | ...                                   | S by E & S S W        | ...           | 98.4            | B to 7 A. M. \i to 5 P. M. \i to 7 P. M. B to 11 P. M. L on N W at Midnight 7 & 8 P. M.                                                                    |
| 19    | 143.5                 | ...                                   | S S W & S W           | ...           | 133.0           | B to 5 A. M. \i to 10 A. M. \i to 12 A. M. \i to 6 P. M. B to 11 P. M.                                                                                     |
| 20    | 143.5                 | ...                                   | S S W                 | ...           | 170.1           | B to 8 A. M. \i to 3 P. M. \i to 7 P. M. B to 11 P. M. L on N at 7 & 10 P. M. T & D at 2½ P. M.                                                            |
| 21    | 144.0                 | ...                                   | S S W & W             | ...           | 150.4           | B to 7 A. M. \i to 10 A. M. \i to 1 P. M. S to 5 P. M. \i to 7 P. M. B to 11 P. M. L on N at 11½ P. M.                                                     |

\i Cirri,—i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i Nimbi,  
\i Cirro-cumuli, B clear, S stratus, O overcast, T thunder, L lightning  
R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of September 1873.*

Solar Radiation, Weather, &c.,

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |                |                 | General aspect of the Sky.                                                                            |
|-------|-----------------------|---------------------------------|-----------------------|----------------|-----------------|-------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure. | Daily Velocity. |                                                                                                       |
|       | °                     | Inches                          |                       |                |                 |                                                                                                       |
| 22    | 141.8                 | ...                             | S W & W by N          | ...            | 95.7            | B to 12 A. M. ~i to 5 P. M. B to 11 P. M.                                                             |
| 23    | 143.0                 | ...                             | W by N & W            | ...            | 113.3           | B to 6 A. M. ~i to 8 A. M. B to 11 A. M. ~i to 4 P. M. B to 11 P. M. T at 2½ & 3½ P. M. D at 3½ P. M. |
| 24    | 139.0                 | ...                             | W, N W & S W          | ...            | 99.0            | B to 5 P. M. ~i to 6 P. M. O to 11 P. M. T at 4 P. M.                                                 |
| 25    | 131.0                 | ...                             | S W & S S W           | ...            | 120.8           | S to 8 A. M. ~i to 1 P. M. S to 5 P. M. ~i & ~i to 11 P. M. T at 3½ & 4½ P. M.                        |
| 26    | 141.5                 | ...                             | S S W & S W           | ...            | 139.9           | B to 1 A. M. ~i to 10 A. M. ~i to 1 P. M. ~i to 4 P. M. B to 11 P. M. L on N E at 11 P. M.            |
| 27    | 143.0                 | ...                             | S W & W               | ...            | 123.6           | B to 1 P. M. ~i to 11 P. M.                                                                           |
| 28    | 144.4                 | ...                             | S W                   | ...            | 135.3           | B to 7 A. M. ~i to 1 P. M. ~i to 4 P. M. ~i to 6 P. M. B to 11 P. M. D at 2½ P. M.                    |
| 29    | 146.8                 | ...                             | S W, E & S by E       | ...            | 104.8           | B to 10 A. M. ~i to 8 P. M. ~i to 11 P. M. L on N W between 9½ & 10½ P. M. D at 6½ P. M.              |
| 30    | 139.0                 | ...                             | S by E & E by S       | ...            | 95.8            | Clouds of different kinds. T at 4½ & 5 P. M. D at 3½ P. M.                                            |

~i Cirri —i Strati, ~i Cumuli, ~i Cirro-strati, ~i Cumulo-strati ~i Nimbi.  
~i Cirro-Cumuli, B clear, S stratoni, O overcast, T thunder, L lightning.  
R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of September 1873.*

MONTHLY RESULTS.

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|                                                                  | Inches. |
|------------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..                | 29.668  |
| Max. height of the Barometer occurred at 9 A. M. on the 17th ... | 29.872  |
| Min. height of the Barometer occurred at 3 P. M. on the 4th ...  | 29.429  |
| Extreme range of the Barometer during the month ...              | 0.443   |
| Mean of the daily Max. Pressures ... ..                          | 29.726  |
| Ditto ditto Min. ditto ... ..                                    | 29.605  |
| Mean daily range of the Barometer during the month ...           | 0.121   |

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|                                                          | °    |
|----------------------------------------------------------|------|
| Mean Dry Bulb Thermometer for the month ... ..           | 84.3 |
| Max. Temperature occurred at 2 P. M. on the 29th ...     | 93.6 |
| Min. Temperature occurred at 6 P. M. on the 6th ...      | 76.5 |
| Extreme range of the Temperature during the month ...    | 17.1 |
| Mean of the daily Max. Temperature ... ..                | 89.7 |
| Ditto ditto Min. ditto, ... ..                           | 80.7 |
| Mean daily range of the Temperature during the month ... | 9.0  |

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|                                                               |      |
|---------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..                | 80.9 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ... | 3.4  |
| Computed Mean Dew-point for the month ... ..                  | 78.5 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ...   | 5.8  |

|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.955   |

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|                                                                        | Troy grain. |
|------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                             | 10.23       |
| Additional Weight of Vapour required for complete saturation ...       | 2.05        |
| Mean degree of humidity for the month, complete saturation being unity | 0.83        |

|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 137.3 |

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|                                                                                                      | Inches. |
|------------------------------------------------------------------------------------------------------|---------|
| Rained 21 days,—Max. fall of rain during 24 hours ... ..                                             | 2.92    |
| Total amount of rain during the month ... ..                                                         | 5.82    |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month ... .. | 5.44.   |
| Prevailing direction of the Wind ... .. S. S. W & S. W.                                              |         |

\* Height 70 feet 10 inches above ground.







*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of October 1873.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at 32° Fahr. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|-------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                 | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                         | Inches.                                   | Inches. | Inches. | °                             | °                                             | °    | °     |
| 1     | 29.799                                          | 29.858                                    | 29.725  | 0.133   | 84.9                          | 91.0                                          | 79.5 | 11.5  |
| 2     | .788                                            | .855                                      | .724    | .131    | 84.8                          | 91.5                                          | 80.0 | 11.5  |
| 3     | .777                                            | .842                                      | .701    | .141    | 85.7                          | 93.0                                          | 78.5 | 14.5  |
| 4     | .773                                            | .827                                      | .713    | .114    | 83.9                          | 89.5                                          | 79.2 | 10.3  |
| 5     | .788                                            | .854                                      | .739    | .115    | 84.4                          | 91.0                                          | 78.0 | 13.0  |
| 6     | .832                                            | .907                                      | .782    | .125    | 82.6                          | 89.5                                          | 76.8 | 12.7  |
| 7     | .843                                            | .915                                      | .778    | .137    | 82.1                          | 88.8                                          | 76.0 | 12.8  |
| 8     | .844                                            | .908                                      | .792    | .116    | 81.8                          | 88.5                                          | 75.5 | 13.0  |
| 9     | .877                                            | .950                                      | .825    | .125    | 81.5                          | 87.5                                          | 75.0 | 12.5  |
| 10    | .891                                            | .963                                      | .827    | .136    | 82.6                          | 89.1                                          | 77.0 | 12.1  |
| 11    | .882                                            | .950                                      | .818    | .132    | 79.4                          | 86.2                                          | 77.0 | 9.2   |
| 12    | .784                                            | .851                                      | .703    | .148    | 80.4                          | 87.6                                          | 76.0 | 11.6  |
| 13    | .771                                            | .835                                      | .712    | .123    | 80.9                          | 88.0                                          | 76.5 | 11.5  |
| 14    | .839                                            | .903                                      | .799    | .104    | 81.2                          | 88.3                                          | 75.8 | 12.5  |
| 15    | .824                                            | .888                                      | .754    | .134    | 82.3                          | 89.0                                          | 76.5 | 12.5  |
| 16    | .812                                            | .880                                      | .770    | .110    | 82.9                          | 90.0                                          | 76.8 | 13.2  |
| 17    | .840                                            | .907                                      | .794    | .113    | 82.6                          | 90.5                                          | 76.5 | 14.0  |
| 18    | .840                                            | .905                                      | .781    | .124    | 83.5                          | 90.4                                          | 77.0 | 13.4  |
| 19    | .813                                            | .864                                      | .749    | .115    | 83.7                          | 90.5                                          | 79.5 | 11.0  |
| 20    | .838                                            | .904                                      | .775    | .129    | 84.3                          | 91.5                                          | 79.0 | 12.5  |
| 21    | .857                                            | .915                                      | .806    | .109    | 84.6                          | 90.8                                          | 80.7 | 10.1  |
| 22    | .864                                            | .931                                      | .813    | .118    | 83.8                          | 89.5                                          | 79.4 | 10.1  |
| 23    | .874                                            | .941                                      | .825    | .116    | 81.8                          | 87.8                                          | 77.6 | 10.2  |
| 24    | .862                                            | .932                                      | .810    | .122    | 81.9                          | 88.6                                          | 76.5 | 12.1  |
| 25    | .871                                            | .919                                      | .827    | .092    | 82.0                          | 88.5                                          | 76.8 | 11.7  |
| 26    | .850                                            | .919                                      | .797    | .122    | 80.4                          | 86.3                                          | 74.0 | 12.3  |
| 27    | .821                                            | .881                                      | .764    | .117    | 80.6                          | 87.5                                          | 75.2 | 12.3  |
| 28    | .827                                            | .884                                      | .781    | .103    | 77.5                          | 85.0                                          | 71.2 | 13.8  |
| 29    | .848                                            | .902                                      | .809    | .093    | 77.8                          | 87.3                                          | 70.5 | 16.8  |
| 30    | .870                                            | .961                                      | .819    | .142    | 78.3                          | 88.2                                          | 70.0 | 18.2  |
| 31    | .857                                            | .923                                      | .799    | .124    | .778                          | 87.8                                          | 69.3 | 18.5  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of October 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 80.0                            | 4.9                 | 76.6                | 8.3                          | 0.899                            | 9.61                                             | 2.88                                                                | 0.77                                                                |
| 2     | 80.0                            | 4.8                 | 76.6                | 8.2                          | .899                             | .61                                              | .85                                                                 | .77                                                                 |
| 3     | 80.1                            | 5.6                 | 76.2                | 9.5                          | .887                             | .47                                              | 3.33                                                                | .74                                                                 |
| 4     | 79.2                            | 4.7                 | 75.9                | 8.0                          | .879                             | .42                                              | 2.71                                                                | .78                                                                 |
| 5     | 77.3                            | 7.1                 | 72.3                | 12.1                         | .783                             | 8.37                                             | 3.94                                                                | .68                                                                 |
| 6     | 74.0                            | 8.6                 | 68.0                | 14.6                         | .681                             | 7.30                                             | 4.38                                                                | .63                                                                 |
| 7     | 74.0                            | 8.1                 | 68.3                | 13.8                         | .688                             | .39                                              | .12                                                                 | .64                                                                 |
| 8     | 73.1                            | 8.7                 | 67.0                | 14.8                         | .659                             | .08                                              | .32                                                                 | .62                                                                 |
| 9     | 75.7                            | 5.8                 | 71.6                | 9.9                          | .766                             | 8.23                                             | 3.08                                                                | .73                                                                 |
| 10    | 76.7                            | 5.9                 | 72.6                | 10.0                         | .790                             | .49                                              | .19                                                                 | .73                                                                 |
| 11    | 76.6                            | 2.8                 | 74.6                | 4.8                          | .813                             | 9.11                                             | 1.51                                                                | .86                                                                 |
| 12    | 77.1                            | 3.3                 | 74.8                | 5.6                          | .849                             | .15                                              | .79                                                                 | .84                                                                 |
| 13    | 77.5                            | 3.4                 | 75.1                | 5.8                          | .857                             | .23                                              | .87                                                                 | .83                                                                 |
| 14    | 76.9                            | 4.3                 | 73.9                | 7.3                          | .824                             | 8.88                                             | 2.33                                                                | .79                                                                 |
| 15    | 77.1                            | 5.2                 | 73.5                | 8.8                          | .814                             | .74                                              | .84                                                                 | .76                                                                 |
| 16    | 75.9                            | 7.0                 | 71.0                | 11.9                         | .751                             | .95                                              | 3.74                                                                | .68                                                                 |
| 17    | 76.1                            | 6.5                 | 71.5                | 11.1                         | .763                             | .20                                              | .48                                                                 | .70                                                                 |
| 18    | 76.9                            | 6.6                 | 72.3                | 11.2                         | .783                             | .39                                              | .61                                                                 | .70                                                                 |
| 19    | 78.2                            | 5.5                 | 74.3                | 9.4                          | .835                             | .96                                              | .11                                                                 | .74                                                                 |
| 20    | 76.6                            | 7.7                 | 71.2                | 13.1                         | .756                             | .08                                              | 4.20                                                                | .66                                                                 |
| 21    | 77.7                            | 6.9                 | 72.9                | 11.7                         | .797                             | .52                                              | 3.87                                                                | .69                                                                 |
| 22    | 77.7                            | 6.1                 | 73.4                | 10.4                         | .811                             | .69                                              | .41                                                                 | .72                                                                 |
| 23    | 76.1                            | 5.7                 | 72.1                | 9.7                          | .778                             | .36                                              | .04                                                                 | .73                                                                 |
| 24    | 76.2                            | 5.7                 | 72.2                | 9.7                          | .781                             | .38                                              | .06                                                                 | .73                                                                 |
| 25    | 74.9                            | 7.1                 | 69.9                | 12.1                         | .725                             | 7.79                                             | .68                                                                 | .68                                                                 |
| 26    | 72.9                            | 7.5                 | 67.6                | 12.8                         | .672                             | .25                                              | .69                                                                 | .66                                                                 |
| 27    | 72.4                            | 8.2                 | 66.7                | 13.9                         | .653                             | .03                                              | .98                                                                 | .64                                                                 |
| 28    | 70.1                            | 7.4                 | 64.9                | 12.6                         | .615                             | 6.67                                             | .37                                                                 | .66                                                                 |
| 29    | 70.1                            | 7.7                 | 64.7                | 13.1                         | .611                             | .62                                              | .51                                                                 | .65                                                                 |
| 30    | 69.6                            | 8.7                 | 63.5                | 14.8                         | .588                             | .35                                              | .93                                                                 | .62                                                                 |
| 31    | 68.0                            | 9.8                 | 61.1                | 16.7                         | .543                             | 5.87                                             | 4.26                                                                | .58                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

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taken at the Surveyor General's Office, Calcutta,  
in the month of October 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 29.810                                          | 29.915                                                       | 29.767  | 0.148   | 78.9                          | 82.0                                                             | 73.0 | 9.0   |
| 1              | .831                                            | .905                                                         | .762    | .143    | 78.5                          | 82.0                                                             | 72.7 | 9.3   |
| 2              | .823                                            | .903                                                         | .759    | .144    | 78.0                          | 81.8                                                             | 72.5 | 9.3   |
| 3              | .814                                            | .892                                                         | .749    | .143    | 77.6                          | 81.7                                                             | 72.0 | 9.7   |
| 4              | .815                                            | .886                                                         | .739    | .147    | 77.2                          | 81.5                                                             | 71.5 | 10.0  |
| 5              | .828                                            | .893                                                         | .755    | .138    | 76.8                          | 81.2                                                             | 70.7 | 10.5  |
| 6              | .845                                            | .906                                                         | .764    | .142    | 76.5                          | 81.0                                                             | 69.3 | 11.7  |
| 7              | .860                                            | .927                                                         | .775    | .152    | 77.1                          | 82.0                                                             | 69.3 | 12.7  |
| 8              | .881                                            | .959                                                         | .806    | .153    | 79.6                          | 84.7                                                             | 73.4 | 11.3  |
| 9              | .897                                            | .963                                                         | .814    | .149    | 82.7                          | 86.6                                                             | 77.0 | 9.6   |
| 10             | .896                                            | .959                                                         | .810    | .149    | 84.9                          | 89.5                                                             | 79.2 | 10.3  |
| 11             | .878                                            | .937                                                         | .793    | .144    | 86.9                          | 90.0                                                             | 82.0 | 8.0   |
| Noon.          | .855                                            | .911                                                         | .769    | .142    | 87.8                          | 92.0                                                             | 84.0 | 8.0   |
| 1              | .826                                            | .885                                                         | .751    | .131    | 89.0                          | 92.5                                                             | 79.3 | 13.2  |
| 2              | .801                                            | .855                                                         | .723    | .132    | 88.2                          | 92.5                                                             | 77.5 | 15.0  |
| 3              | .785                                            | .848                                                         | .707    | .141    | 88.2                          | 93.0                                                             | 78.9 | 14.1  |
| 4              | .779                                            | .844                                                         | .701    | .143    | 87.6                          | 91.6                                                             | 79.9 | 11.7  |
| 5              | .783                                            | .840                                                         | .703    | .137    | 86.3                          | 90.5                                                             | 79.5 | 11.0  |
| 6              | .794                                            | .853                                                         | .713    | .140    | 84.2                          | 88.8                                                             | 79.0 | 9.8   |
| 7              | .811                                            | .883                                                         | .738    | .145    | 82.6                          | 87.5                                                             | 78.0 | 9.5   |
| 8              | .831                                            | .898                                                         | .760    | .138    | 81.4                          | 86.0                                                             | 76.0 | 10.0  |
| 9              | .846                                            | .918                                                         | .772    | .146    | 80.4                          | 83.7                                                             | 75.5 | 8.2   |
| 10             | .851                                            | .924                                                         | .783    | .141    | 79.8                          | 83.5                                                             | 75.0 | 8.5   |
| 11             | .848                                            | .919                                                         | .776    | .143    | 79.1                          | 82.6                                                             | 73.5 | 9.1   |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb  
Thermometer Means are derived from the observations made at the several  
hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of October 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 75.6                            | 3.3                 | 73.3                | 5.6                          | 0.800                            | 8.73                                             | 1.74                                                                | 0.83                                                                |
| 1              | 75.3                            | 3.2                 | 73.1                | 5.4                          | .803                             | .70                                              | .65                                                                 | .84                                                                 |
| 2              | 75.1                            | 2.9                 | 73.1                | 4.9                          | .803                             | .70                                              | .49                                                                 | .85                                                                 |
| 3              | 74.8                            | 2.8                 | 72.8                | 4.8                          | .795                             | .62                                              | .45                                                                 | .86                                                                 |
| 4              | 74.6                            | 2.6                 | 72.8                | 4.4                          | .795                             | .64                                              | .31                                                                 | .87                                                                 |
| 5              | 74.3                            | 2.5                 | 72.5                | 4.3                          | .787                             | .56                                              | .27                                                                 | .87                                                                 |
| 6              | 74.0                            | 2.5                 | 72.2                | 4.3                          | .781                             | .48                                              | .27                                                                 | .87                                                                 |
| 7              | 74.4                            | 2.7                 | 72.5                | 4.6                          | .787                             | .54                                              | .38                                                                 | .86                                                                 |
| 8              | 75.0                            | 4.6                 | 71.8                | 7.8                          | .771                             | .31                                              | 2.38                                                                | .78                                                                 |
| 9              | 75.8                            | 6.9                 | 71.0                | 11.7                         | .751                             | .05                                              | 3.67                                                                | .69                                                                 |
| 10             | 76.3                            | 8.6                 | 70.3                | 14.6                         | .734                             | 7.84                                             | 4.65                                                                | .63                                                                 |
| 11             | 76.4                            | 10.5                | 70.1                | 16.8                         | .729                             | .76                                              | 5.49                                                                | .59                                                                 |
| Noon.          | 76.4                            | 11.4                | 69.6                | 18.2                         | .717                             | .62                                              | .98                                                                 | .56                                                                 |
| 1              | 76.1                            | 11.9                | 69.0                | 19.0                         | .704                             | .46                                              | 6.22                                                                | .55                                                                 |
| 2              | 76.5                            | 11.7                | 69.5                | 18.7                         | .715                             | .58                                              | .18                                                                 | .55                                                                 |
| 3              | 76.2                            | 12.0                | 69.0                | 19.2                         | .704                             | .47                                              | .29                                                                 | .54                                                                 |
| 4              | 76.0                            | 11.6                | 69.0                | 18.6                         | .704                             | .47                                              | .05                                                                 | .55                                                                 |
| 5              | 76.3                            | 10.0                | 69.3                | 17.0                         | .711                             | .56                                              | 5.46                                                                | .58                                                                 |
| 6              | 76.6                            | 7.6                 | 71.3                | 12.9                         | .758                             | 8.11                                             | 4.13                                                                | .66                                                                 |
| 7              | 76.7                            | 5.9                 | 72.6                | 10.6                         | .790                             | .49                                              | 3.19                                                                | .73                                                                 |
| 8              | 76.2                            | 5.2                 | 72.6                | 8.8                          | .790                             | .50                                              | 2.77                                                                | .75                                                                 |
| 9              | 75.8                            | 4.6                 | 72.6                | 7.8                          | .790                             | .52                                              | .42                                                                 | .78                                                                 |
| 10             | 75.5                            | 4.3                 | 72.5                | 7.3                          | .787                             | .51                                              | .24                                                                 | .79                                                                 |
| 11             | 75.3                            | 3.8                 | 72.6                | 6.5                          | .790                             | .54                                              | 1.99                                                                | .81                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of October 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                                 |
|-------|-----------------------|---------------------------------|-----------------------|---------------|-----------------|----------------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                            |
|       | °                     | Inches                          |                       | lb            | Miles           |                                                                                                                            |
| 1     | 140.0                 | ...                             | E S E & E             | ...           | 87.4            | B to 7 A. M., ~i to 6 P. M., ~i to 11 P. M.                                                                                |
| 2     | 144.6                 | ...                             | E & S E               | ...           | 100.9           | B to 7 A. M., ~i to 6 P. M. B to 11 P. M.                                                                                  |
| 3     | 145.0                 | 2.05                            | S E & E               | 1.8           | 101.5           | ~i to 1 A. M. B to 4 A. M., ~i to 7 A. M., ~i to 11 A. M., ~i to 11 P. M. T & L at 8½ & 11 P. M. R at 8 & 9 P. M.          |
| 4     | 139.4                 | ...                             | S W & N E             | ...           | 112.6           | S to 4 A. M., ~i to 8 A. M. ~i to 1 P. M. S to 5 P. M., ~i to 8 P. M. B to 11 P. M. T at midnight. L at midnight & 1 A. M. |
| 5     | 138.5                 | ...                             | E N E & N by W        | ...           | 112.4           | B to 11 A. M., ~i to 5 P. M. B to 11 P. M.                                                                                 |
| 6     | 135.6                 | ...                             | N N E & W N W         | ...           | 134.8           | B to 5 A. M., ~i to 11 A. M. B to 5 P. M., ~i to 9 P. M. B to 11 P. M.                                                     |
| 7     | 137.0                 | ...                             | W N W                 | ...           | 189.2           | B to 6 A. M., ~i to 2 P. M. B to 11 P. M. Slightly Foggy from 1 to 4 A. M.                                                 |
| 8     | 133.8                 | ...                             | N by W & W N W        | ...           | 84.5            | B.                                                                                                                         |
| 9     | 139.0                 | ...                             | N W & E by S          | ...           | 35.5            | ~i to 4 A. M., B to 6 A. M., ~i to 5 P. M. B to 8 P. M., ~i to 11 P. M.                                                    |
| 10    | 137.8                 | ...                             | E, E by S & S         | 0.8           | 101.5           | ~i to 6 A. M., ~i to 12 A. M., ~i to 4 P. M. S to 11 P. M.                                                                 |
| 11    | 134.0                 | 0.20                            | S & S by E            | 4.0           | 113.5           | O to 7 A. M. S to 6 P. M. O to 11 P. M. Strong wind at 12¼ A. M. Slight R at 5½ A. M. 1, 8½ & 9½ P. M.                     |
| 12    | 144.5                 | 0.07                            | E S E, E by N & E     | ...           | 126.9           | O to 3 A. M., ~i to 7 A. M., ~i to 6 P. M. B to 11 P. M. Slight R at 5½ P. M.                                              |
| 13    | 138.0                 | 0.08                            | E N E                 | 0.7           | 176.9           | B to 4 A. M. O to 8 A. M., ~i to 6 P. M. B to 11 P. M. L at 6½ P. M. Slight R at 8½ A. M. 1½ & 2 P. M.                     |

~i Cirri,—i Strati, ~i Cumuli, ~i Cirro-strati, ~i Cumulo-strati, ~i Nimbi,  
~i Cirro-cumuli, B clear, S straton, O overcast, T thunder, L lightning,  
R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of October 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                  |               |                 | General aspect of the Sky.                                                          |
|-------|-----------------------|---------------------------------|------------------------|---------------|-----------------|-------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction.  | Max. Pressure | Daily Velocity. |                                                                                     |
|       | °                     | Inches                          |                        | lb            | Miles.          |                                                                                     |
| 14    | 139.0                 | ...                             | E N E                  | ...           | 248.5           | B to 3 A. M., \i to 6 A. M., \i to 4 P. M., \i to 6 P. M. B to 11 P. M.             |
| 15    | 136.8                 | ...                             | E N E & E by N         | ...           | 137.8           | B to 5 A. M., \i to 12 A. M. \i to 5 P. M. B to 11 P. M.                            |
| 16    | 135.0                 | ...                             | E by N                 | ...           | 88.8            | B to 10 A. M., \i to 5 P. M. B to 11 P. M.                                          |
| 17    | 138.0                 | ...                             | E by N & E N E         | ...           | 97.4            | B to 10 A. M., \i to 6 P. M. B to 11 P. M.                                          |
| 18    | 141.5                 | ...                             | E N E                  | ...           | 94.7            | B to 11 A. M., \i to 3 P. M. B to 11 P. M.                                          |
| 19    | 140.7                 | ...                             | E N E, E & S S E       | ...           | 85.7            | B to 1 A. M. S to 5 A. M., \i to 7 A. M. B to 10 A. M., \i to 6 P. M. B to 11 P. M. |
| 20    | 137.0                 | ...                             | S E & E                | ...           | 92.8            | B.                                                                                  |
| 21    | 145.0                 | ...                             | E & S E                | ...           | 65.5            | B to 2 A. M., \i to 5 P. M. B to 11 P. M. D at 4½ A. M.                             |
| 22    | 138.0                 | ...                             | S S E & S by E         | ...           | 72.7            | B to 4 A. M., clouds of different kinds to 6 P. M. B to 11 P. M.                    |
| 23    | 132.8                 | ...                             | S by E                 | ...           | 70.0            | B to 3 A. M., \i to 3 P. M., \i to 6 P. M. B to 11 P. M.                            |
| 24    | 141.0                 | ...                             | S by E, E S E & E by S | ...           | 48.1            | B to 3 A. M., \i to 8 A. M. \i to 12 A. M. S to 11 P. M. D at 1 P. M.               |
| 25    | 138.8                 | ...                             | E by S & E             | ...           | 19.0            | B to 1 A. M., \i to 7 P. M. B 11 P. M.                                              |
| 26    | 142.0                 | ...                             | E                      | ...           | 71.0            | B to 4 A. M., \i to 8 P. M. B to 11 P. M.                                           |
| 27    | 139.0                 | ...                             | E & N N E              | ...           | 15.7            | B to 5 A. M., \i to 11 P. M. B to 4 A. M., \i to 7 P. M. B to 11 P. M.              |
| 28    | 136.8                 | ...                             | N N E, N E & E by N    | ...           | ...             | B to 5 A. M., \i to 11 P. M. B to 3 A. M., \i to 8 P. M. B to 11 P. M.              |
| 29    | 129.0                 | ...                             | E by N & E N E         | ...           | ...             | \i to 3 A. M. B to 12 A. M., \i to 7 P. M. S to 11 P. M.                            |
| 30    | 135.8                 | ...                             | E N E & N              | 0.5           | 91.0            |                                                                                     |
| 31    | 140.0                 | ...                             | N & N by W             | 0.8           | 184.2           |                                                                                     |

\i Cirri, -i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i Nimbi, \i Cirro-cumuli, B clear, S stratonii, O overcast, T thunder, L lightning R. rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of October 1873.*

MONTHLY RESULTS.

|                                                                     | Inches. |
|---------------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..                   | 29.834  |
| Max. height of the Barometer occurred at 9 A. M. on the 10th ... .. | 29.963  |
| Min. height of the Barometer occurred at 4 P. M. on the 3rd ... ..  | 29.701  |
| Extreme range of the Barometer during the month ... ..              | 0.262   |
| Mean of the daily Max. Pressures ... ..                             | 29.899  |
| Ditto ditto Min. ditto ... ..                                       | 29.778  |
| Mean daily range of the Barometer during the month ... ..           | 0.121   |

|                                                             | °    |
|-------------------------------------------------------------|------|
| Mean Dry Bulb Thermometer for the month ... ..              | 82.0 |
| Max. Temperature occurred at 3 P. M. on the 3rd ... ..      | 93.0 |
| Min. Temperature occurred at 6 & 7 A. M. on the 31st ... .. | 69.3 |
| Extreme range of the Temperature during the month ... ..    | 23.7 |
| Mean of the daily Max. Temperature ... ..                   | 89.0 |
| Ditto ditto Min. ditto, ... ..                              | 76.4 |
| Mean daily range of the Temperature during the month ... .. | 12.6 |

|                                                                  |      |
|------------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..                   | 75.6 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ... .. | 6.4  |
| Computed Mean Dew-point for the month ... ..                     | 71.1 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ... ..   | 10.9 |

|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.753   |

|                                                                               | Troy grain. |
|-------------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                                    | 8.10        |
| Additional Weight of Vapour required for complete saturation ... ..           | 3.37        |
| Mean degree of humidity for the month, complete saturation being unity ... .. | 0.71        |

|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 138.5 |

|                                                                                                      | Inches. |
|------------------------------------------------------------------------------------------------------|---------|
| Rained 6 days,—Max. fall of rain during 24 hours ... ..                                              | 2.05    |
| Total amount of rain during the month ... ..                                                         | 2.40    |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month ... .. | 2.17    |
| Prevailing direction of the Wind ... .. E. & E. N. E.                                                |         |

\* Height 70 feet 10 inches above ground.





*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of November 1873.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at 32° Falt. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|-------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                 | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                         | Inches.                                   | Inches. | Inches. | o                             | o                                             | o    | o     |
| 1     | 29.870                                          | 29.933                                    | 29.823  | 0.110   | 76.2                          | 86.2                                          | 68.5 | 17.7  |
| 2     | .885                                            | .952                                      | .828    | .124    | 78.2                          | 88.2                                          | 70.0 | 18.2  |
| 3     | .931                                            | .988                                      | .878    | .110    | 78.1                          | 82.0                                          | 74.0 | 8.0   |
| 4     | .998                                            | 30.076                                    | .945    | .131    | 80.8                          | 87.5                                          | 76.5 | 11.0  |
| 5     | 30.013                                          | .091                                      | .948    | .143    | 82.0                          | 89.5                                          | 76.0 | 13.5  |
| 6     | .012                                            | .085                                      | .955    | .130    | 82.5                          | 90.7                                          | 75.0 | 15.7  |
| 7     | .011                                            | .071                                      | .957    | .114    | 82.6                          | 90.5                                          | 76.4 | 14.1  |
| 8     | 29.996                                          | .067                                      | .928    | .139    | 81.4                          | 88.3                                          | 76.3 | 12.0  |
| 9     | 30.003                                          | .074                                      | .947    | .127    | 79.2                          | 86.5                                          | 72.8 | 13.7  |
| 10    | .017                                            | .076                                      | .972    | .104    | 75.8                          | 85.0                                          | 68.4 | 16.6  |
| 11    | .029                                            | .095                                      | .978    | .117    | 73.9                          | 84.7                                          | 64.5 | 20.2  |
| 12    | .035                                            | .115                                      | .969    | .146    | 74.3                          | 85.0                                          | 65.5 | 19.5  |
| 13    | .025                                            | .088                                      | .975    | .113    | 74.9                          | 84.5                                          | 67.0 | 17.5  |
| 14    | .012                                            | .080                                      | .953    | .127    | 75.3                          | 85.2                                          | 67.0 | 18.2  |
| 15    | .035                                            | .104                                      | .972    | .132    | 76.2                          | 85.5                                          | 68.7 | 16.8  |
| 16    | .063                                            | .132                                      | 30.017  | .115    | 74.5                          | 85.0                                          | 66.3 | 18.7  |
| 17    | .056                                            | .138                                      | 29.986  | .152    | 74.3                          | 84.0                                          | 66.2 | 17.8  |
| 18    | .028                                            | .110                                      | .967    | .143    | 72.9                          | 83.0                                          | 64.0 | 19.0  |
| 19    | .038                                            | .100                                      | .983    | .117    | 74.0                          | 82.2                                          | 66.5 | 15.7  |
| 20    | .035                                            | .101                                      | .979    | .122    | 73.5                          | 82.7                                          | 65.5 | 17.2  |
| 21    | .017                                            | .092                                      | .955    | .137    | 73.0                          | 83.0                                          | 66.0 | 17.0  |
| 22    | .027                                            | .096                                      | .969    | .127    | 73.0                          | 82.4                                          | 66.5 | 15.9  |
| 23    | .023                                            | .088                                      | .961    | .127    | 72.6                          | 81.0                                          | 65.5 | 15.5  |
| 24    | .013                                            | .077                                      | .957    | .120    | 74.2                          | 84.5                                          | 65.8 | 18.7  |
| 25    | .034                                            | .105                                      | .977    | .128    | 74.5                          | 84.5                                          | 66.0 | 18.5  |
| 26    | .031                                            | .105                                      | .970    | .135    | 75.0                          | 83.3                                          | 67.5 | 15.8  |
| 27    | .006                                            | .057                                      | .949    | .108    | 73.7                          | 78.5                                          | 69.7 | 8.8   |
| 28    | 29.951                                          | .003                                      | .885    | .118    | 71.9                          | 75.6                                          | 69.0 | 6.6   |
| 29    | .977                                            | .050                                      | .918    | .132    | 69.4                          | 73.2                                          | 65.0 | 8.2   |
| 30    | 30.034                                          | .077                                      | .996    | .081    | 69.0                          | 74.6                                          | 64.2 | 10.4  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

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taken at the Surveyor General's Office, Calcutta,  
in the month of November 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 64.1                            | 12.1                | 55.6                | 20.6                         | 0.452                            | 4.90                                             | 4.76                                                                | 0.51                                                                |
| 2     | 69.4                            | 8.8                 | 63.2                | 15.0                         | .582                             | 6.30                                             | 3.95                                                                | .62                                                                 |
| 3     | 73.6                            | 4.5                 | 70.4                | 7.7                          | .736                             | 7.97                                             | 2.25                                                                | .78                                                                 |
| 4     | 76.5                            | 4.3                 | 73.5                | 7.3                          | .814                             | 8.78                                             | .29                                                                 | .79                                                                 |
| 5     | 77.2                            | 4.8                 | 73.8                | 8.2                          | .822                             | .84                                              | .63                                                                 | .77                                                                 |
| 6     | 76.0                            | 6.5                 | 71.4                | 11.1                         | .761                             | .17                                              | 3.47                                                                | .70                                                                 |
| 7     | 76.1                            | 6.5                 | 71.5                | 11.1                         | .763                             | .20                                              | .48                                                                 | .70                                                                 |
| 8     | 76.1                            | 5.3                 | 72.4                | 9.0                          | .785                             | .45                                              | 2.82                                                                | .75                                                                 |
| 9     | 71.2                            | 8.0                 | 65.6                | 13.6                         | .630                             | 6.80                                             | 3.76                                                                | .64                                                                 |
| 10    | 66.6                            | 9.2                 | 60.2                | 15.6                         | .527                             | 5.72                                             | .82                                                                 | .60                                                                 |
| 11    | 65.3                            | 8.6                 | 59.3                | 14.6                         | .511                             | .57                                              | .44                                                                 | .62                                                                 |
| 12    | 66.3                            | 8.0                 | 60.7                | 13.6                         | .536                             | .83                                              | .29                                                                 | .64                                                                 |
| 13    | 67.2                            | 7.7                 | 61.8                | 13.1                         | .555                             | 6.05                                             | .23                                                                 | .65                                                                 |
| 14    | 68.0                            | 7.3                 | 62.9                | 12.4                         | .576                             | .28                                              | .12                                                                 | .67                                                                 |
| 15    | 68.2                            | 8.0                 | 62.6                | 13.6                         | .570                             | .19                                              | .47                                                                 | .64                                                                 |
| 16    | 66.7                            | 7.8                 | 61.2                | 13.3                         | .544                             | 5.94                                             | .24                                                                 | .65                                                                 |
| 17    | 66.9                            | 7.4                 | 61.7                | 12.6                         | .554                             | 6.03                                             | .09                                                                 | .66                                                                 |
| 18    | 65.4                            | 7.5                 | 69.4                | 13.5                         | .513                             | 5.60                                             | .13                                                                 | .64                                                                 |
| 19    | 67.4                            | 6.6                 | 62.8                | 11.2                         | .574                             | 6.27                                             | 2.77                                                                | .69                                                                 |
| 20    | 66.6                            | 7.0                 | 61.6                | 11.9                         | .552                             | .02                                              | .88                                                                 | .68                                                                 |
| 21    | 66.1                            | 6.9                 | 60.6                | 12.4                         | .534                             | 5.84                                             | .92                                                                 | .67                                                                 |
| 22    | 65.3                            | 7.7                 | 59.1                | 13.9                         | .508                             | .55                                              | 3.21                                                                | .63                                                                 |
| 23    | 65.4                            | 7.2                 | 59.6                | 13.0                         | .516                             | .65                                              | .01                                                                 | .65                                                                 |
| 24    | 67.5                            | 6.7                 | 62.8                | 11.4                         | .574                             | 6.27                                             | 2.82                                                                | .69                                                                 |
| 25    | 67.3                            | 7.2                 | 62.3                | 12.2                         | .565                             | .16                                              | 3.02                                                                | .67                                                                 |
| 26    | 67.2                            | 7.8                 | 61.7                | 13.3                         | .554                             | .03                                              | .28                                                                 | .65                                                                 |
| 27    | 67.0                            | 6.7                 | 62.3                | 11.4                         | .565                             | .17                                              | 2.79                                                                | .69                                                                 |
| 28    | 65.3                            | 6.6                 | 60.0                | 11.9                         | .523                             | 5.73                                             | .75                                                                 | .68                                                                 |
| 29    | 65.2                            | 4.2                 | 61.8                | 7.6                          | .555                             | 6.11                                             | 1.75                                                                | .78                                                                 |
| 30    | 65.0                            | 4.0                 | 61.8                | 7.2                          | .555                             | .12                                              | .64                                                                 | .79                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of November 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 30.008                                          | 30.079                                                       | 29.872  | 0.207   | 72.1                          | 79.2                                                             | 65.5 | 13.7  |
| 1              | .000                                            | .073                                                         | .860    | .213    | 71.5                          | 78.5                                                             | 65.2 | 13.3  |
| 2              | 29.993                                          | .060                                                         | .851    | .209    | 70.8                          | 78.0                                                             | 65.0 | 13.0  |
| 3              | .986                                            | .053                                                         | .837    | .216    | 70.3                          | 77.7                                                             | 64.7 | 13.0  |
| 4              | .983                                            | .052                                                         | .833    | .219    | 69.9                          | 77.0                                                             | 64.5 | 12.5  |
| 5              | .995                                            | .069                                                         | .846    | .223    | 69.4                          | 76.6                                                             | 64.2 | 12.4  |
| 6              | 30.012                                          | .084                                                         | .871    | .213    | 68.9                          | 76.5                                                             | 64.0 | 12.5  |
| 7              | .030                                            | .101                                                         | .895    | .206    | 69.1                          | 76.7                                                             | 65.0 | 11.7  |
| 8              | .053                                            | .115                                                         | .918    | .197    | 71.8                          | 80.0                                                             | 66.7 | 13.3  |
| 9              | .071                                            | .138                                                         | .933    | .205    | 75.6                          | 83.8                                                             | 68.3 | 15.5  |
| 10             | .070                                            | .130                                                         | .926    | .204    | 78.0                          | 86.0                                                             | 69.3 | 16.7  |
| 11             | .052                                            | .115                                                         | .904    | .211    | 80.8                          | 88.2                                                             | 70.5 | 17.7  |
| Noon.          | .025                                            | .085                                                         | .885    | .200    | 82.2                          | 89.1                                                             | 71.8 | 17.3  |
| 1              | 29.993                                          | .050                                                         | .856    | .194    | 83.1                          | 90.3                                                             | 72.5 | 17.8  |
| 2              | .969                                            | .019                                                         | .834    | .185    | 83.6                          | 90.5                                                             | 72.8 | 17.7  |
| 3              | .957                                            | .017                                                         | .830    | .187    | 83.4                          | 90.7                                                             | 72.5 | 18.2  |
| 4              | .953                                            | .019                                                         | .825    | .194    | 82.2                          | 89.0                                                             | 72.0 | 17.0  |
| 5              | .961                                            | .026                                                         | .823    | .203    | 80.6                          | 87.6                                                             | 70.5 | 17.1  |
| 6              | .974                                            | .044                                                         | .840    | .204    | 78.1                          | 85.0                                                             | 69.5 | 15.5  |
| 7              | .993                                            | .064                                                         | .856    | .208    | 76.4                          | 83.5                                                             | 68.5 | 15.0  |
| 8              | 30.011                                          | .076                                                         | .879    | .197    | 75.2                          | 82.8                                                             | 67.5 | 15.3  |
| 9              | .024                                            | .090                                                         | .902    | .188    | 74.1                          | 81.5                                                             | 66.5 | 15.0  |
| 10             | .029                                            | .097                                                         | .908    | .189    | 73.2                          | 80.5                                                             | 65.5 | 15.0  |
| 11             | .022                                            | .089                                                         | .902    | .187    | 72.5                          | 79.7                                                             | 65.0 | 14.7  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb  
Thermometer Means are derived from the observations made at the several  
hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of November 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid-<br>night. | 67.8                            | 4.3                 | 61.4                | 7.7                          | 0.605                            | 6.63                                             | 1.90                                                                | 0.78                                                                |
| 1              | 67.3                            | 4.2                 | 63.9                | 7.6                          | .595                             | .52                                              | .86                                                                 | .78                                                                 |
| 2              | 66.8                            | 4.0                 | 63.6                | 7.2                          | .590                             | .48                                              | .72                                                                 | .79                                                                 |
| 3              | 66.3                            | 4.0                 | 63.1                | 7.2                          | .580                             | .38                                              | .70                                                                 | .79                                                                 |
| 4              | 66.0                            | 3.9                 | 62.9                | 7.0                          | .576                             | .34                                              | .64                                                                 | .80                                                                 |
| 5              | 65.6                            | 3.8                 | 62.6                | 6.8                          | .570                             | .29                                              | .58                                                                 | .80                                                                 |
| 6              | 65.2                            | 3.7                 | 62.2                | 6.7                          | .563                             | .20                                              | .54                                                                 | .80                                                                 |
| 7              | 65.3                            | 3.8                 | 62.3                | 6.8                          | .565                             | .22                                              | .56                                                                 | .80                                                                 |
| 8              | 66.7                            | 5.1                 | 62.6                | 9.2                          | .570                             | .26                                              | 2.19                                                                | .74                                                                 |
| 9              | 68.4                            | 7.2                 | 63.4                | 12.2                         | .586                             | .37                                              | 3.09                                                                | .67                                                                 |
| 10             | 69.4                            | 9.2                 | 63.0                | 15.6                         | .578                             | .24                                              | 4.14                                                                | .60                                                                 |
| 11             | 70.2                            | 10.6                | 62.8                | 18.0                         | .574                             | .18                                              | .89                                                                 | .56                                                                 |
|                |                                 |                     |                     |                              |                                  |                                                  |                                                                     |                                                                     |
| Noon.          | 70.1                            | 12.1                | 61.6                | 20.6                         | .552                             | 5.91                                             | 5.63                                                                | .51                                                                 |
| 1              | 70.2                            | 12.9                | 61.2                | 21.9                         | .544                             | .83                                              | 6.03                                                                | .49                                                                 |
| 2              | 70.6                            | 12.9                | 61.6                | 21.9                         | .552                             | .90                                              | .10                                                                 | .49                                                                 |
| 3              | 70.6                            | 12.9                | 61.5                | 21.9                         | .550                             | .89                                              | .07                                                                 | .49                                                                 |
| 4              | 70.2                            | 12.0                | 61.8                | 20.4                         | .555                             | .96                                              | 5.58                                                                | .52                                                                 |
| 5              | 70.6                            | 10.0                | 63.6                | 17.0                         | .590                             | 6.35                                             | 4.66                                                                | .58                                                                 |
| 6              | 70.9                            | 7.2                 | 65.9                | 12.2                         | .636                             | .89                                              | 3.33                                                                | .67                                                                 |
| 7              | 70.5                            | 5.9                 | 66.4                | 10.0                         | .646                             | 7.03                                             | 2.69                                                                | .72                                                                 |
| 8              | 69.9                            | 5.3                 | 66.2                | 9.0                          | .642                             | 6.99                                             | .38                                                                 | .75                                                                 |
| 9              | 69.3                            | 4.8                 | 65.9                | 8.2                          | .636                             | .95                                              | .12                                                                 | .77                                                                 |
| 10             | 68.7                            | 4.5                 | 65.1                | 8.1                          | .619                             | .78                                              | .04                                                                 | .77                                                                 |
| 11             | 68.2                            | 4.3                 | 64.8                | 7.7                          | .613                             | .72                                              | 1.91                                                                | .78                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of November 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge<br>1½ ft. above<br>Ground. | WIND.                 |                |                 | General aspect of the Sky.                                                                      |
|-------|-----------------------|---------------------------------------|-----------------------|----------------|-----------------|-------------------------------------------------------------------------------------------------|
|       |                       |                                       | Prevailing direction. | Max. Pressure. | Daily Velocity. |                                                                                                 |
|       | °                     | Inches                                |                       | lb             | Miles.          |                                                                                                 |
| 1     | 135.0                 | ...                                   | N by W & NNE          | 0.5            | 233.3           | ☼                                                                                               |
| 2     | 139.5                 | ...                                   | N & NE                | ...            | 192.9           | Chiefly ☼                                                                                       |
| 3     | 103.0                 | 0.01                                  | NE & E by S           | ...            | 139.8           | ☼ & ☼ to 7 A. M. O to 6 P. M.<br>☼ to 11 P. M. D at 8½, 10½, 12<br>A. M. 1 & 8 P. M.            |
| 4     | 141.0                 | ...                                   | E by S & SSW          | ...            | 61.8            | ☼ & ☼ to 11 A. M., ☼ to 6<br>P. M. B to 11 P. M. T at 3½ P. M.                                  |
| 5     | 135.0                 | ...                                   | SSW & N by W          | ...            | 54.8            | B to 9 A. M., ☼ to 5 P. M. B<br>to 11 P. M.                                                     |
| 6     | 140.0                 | ...                                   | N by W & NE           | 1.2            | 95.2            | B.                                                                                              |
| 7     | 136.5                 | ...                                   | NE & S                | ...            | 77.2            | ☼ to 1 A. M. B to 3 P. M., ☼<br>to 6 P. M., ☼ to 11 P. M. Slightly<br>foggy at 4 & 5 A. M.      |
| 8     | 138.0                 | ...                                   | SSW, SW & W           | ...            | 83.1            | B to 11 A. M., ☼ to 7 P. M. B<br>to 11 P. M.                                                    |
| 9     | 132.8                 | ...                                   | NE                    | ...            | 104.6           | ☼ to 1 A. M. B to 4 A. M., ☼<br>to 6 A. M. B to 11 P. M.                                        |
| 10    | 138.7                 | ...                                   | ENE & NW              | ...            | 99.3            | B.                                                                                              |
| 11    | 133.0                 | ...                                   | NNW & NE              | ...            | 81.0            | B.                                                                                              |
| 12    | 137.5                 | ...                                   | NE & ENE              | ...            | 82.9            | B to 9 A. M., ☼ to 6 P. M. B<br>11 P. M. Foggy from 9 to 11 P. M.                               |
| 13    | 137.0                 | ...                                   | NE & ENE              | ...            | 93.1            | Chiefly B.                                                                                      |
| 14    | 133.0                 | ...                                   | ENE & SSW             | ...            | 74.2            | B. Slightly foggy at 8 & 9 P. M.                                                                |
| 15    | 131.0                 | ...                                   | SSW & NE              | ...            | 89.8            | B to 8 A. M., ☼ to 2 P. M. B<br>to 11 P. M.                                                     |
| 16    | 133.4                 | ...                                   | NE & N                | 0.4            | 109.3           | B.                                                                                              |
| 17    | 136.5                 | ...                                   | E by N & N by E       | ...            | 100.4           | B.                                                                                              |
| 18    | 129.4                 | ...                                   | N by E & NNW          | ...            | 101.6           | B to 5 A. M., ☼ to 5 P. M. B<br>to 11 P. M.                                                     |
| 19    | 129.4                 | ...                                   | N by E & ENE          | ...            | 42.7            | B to 4 A. M., ☼ to 10 A. M.,<br>☼ to 6 P. M. B to 11 P. M. Slightly<br>foggy from 9 to 11 P. M. |
| 20    | 132.0                 | ...                                   | ENE & N               | ...            | 64.7            | B to 10 A. M., ☼ to 6 P. M.<br>B to 11 P. M. Slightly foggy at<br>midnight & 1 A. M.            |
| 21    | 130.0                 | ...                                   | N, N by W & NE        | ...            | 79.0            | B to 6 A. M., ☼ to 1 P. M. B<br>to 11 P. M.                                                     |

☼ Cirri, —i Strati, ☼ Cumuli, ☼ Cirro-strati, ☼ Cumulo-strati, ☼ Nimbi,  
☼ Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning,  
R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of November 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge<br>1½ ft. above<br>Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                                                         |
|-------|-----------------------|---------------------------------------|-----------------------|---------------|-----------------|--------------------------------------------------------------------------------------------------------------------|
|       |                       |                                       | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                                                    |
|       | °                     | Inches                                |                       | lb            | Mile.           |                                                                                                                    |
| 22    | 129.4                 | ...                                   | N E                   | ...           | 116.8           | \\i to 5 A. M., \\i to 8 A. M. B to 11 A. M., \\i to 6 P. M. B to 11 P. M. Slightly foggy from midnight to 2 A. M. |
| 23    | 130.0                 | ...                                   | N E & E N E           | ...           | 136.5           | B to 3 A. M., \\i to 7 P. M. B to 11 P. M. Slightly foggy at 11 P. M.                                              |
| 24    | 134.0                 | ...                                   | E N E & E             | ...           | 73.7            | B to 6 A. M., \\i to 1 P. M. \\i to 6 P. M. B to 11 P. M. Slightly foggy at midnight.                              |
| 25    | 136.0                 | ...                                   | E & E N E             | ...           | 84.1            | B to 6 A. M., \\i to 5 P. M. B to 7 P. M., \\i to 11 P. M. Slightly foggy at 11 P. M.                              |
| 26    | 128.0                 | ...                                   | E N E & N             | ...           | 132.1           | \\i to 10 A. M., \\i to 9 P. M. O to 11 P. M. Slightly foggy at midnight.                                          |
| 27    | 112.0                 | ...                                   | N by W & N            | ...           | 96.5            | O. D at 11 P. M.                                                                                                   |
| 28    | 100.0                 | 0.04                                  | NNE, N & E by N       | ...           | 113.4           | Chiefly O. D after intervals.                                                                                      |
| 29    | ...                   | 0.09                                  | E by N                | ...           | 81.9            | O. D after intervals.                                                                                              |
| 30    | 93.0                  | ...                                   | Variable              | ...           | 76.2            | Chiefly O Slightly foggy at 7 P. M.                                                                                |

\\i Cirri,—i Strati, \\i Cumuli, \\i Cirro-strati, \\i Cumulo-strati, \\i Nimbi,  
\\i Cirro-cumuli, B clear, S strati, O overcast, T thunder, L lightning  
R. rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of November 1873.*

MONTHLY RESULTS.

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|                                                                  | Inches. |
|------------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..                | 30.007  |
| Max. height of the Barometer occurred at 9 A. M. on the 17th ... | 30.138  |
| Min. height of the Barometer occurred at 5 P. M. on the 1st ...  | 29.823  |
| Extreme range of the Barometer during the month ...              | 0.315   |
| Mean of the daily Max. Pressures ... ..                          | 30.074  |
| Ditto ditto Min. ditto ... ..                                    | 29.950  |
| Mean daily range of the Barometer during the month ...           | 0.124   |

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|                                                          | °    |
|----------------------------------------------------------|------|
| Mean Dry Bulb Thermometer for the month ... ..           | 75.6 |
| Max. Temperature occurred at 3 P. M. on the 6th ... ..   | 90.7 |
| Min. Temperature occurred at 6 A. M. on the 18th ... ..  | 64.0 |
| Extreme range of the Temperature during the month ... .. | 26.7 |
| Mean of the daily Max. Temperature ... ..                | 83.9 |
| Ditto ditto Min. ditto, ... ..                           | 68.7 |
| Mean daily range of the Temperature during the month ... | 15.2 |

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|                                                               |      |
|---------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..                | 68.5 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ... | 7.1  |
| Computed Mean Dew-point for the month ... ..                  | 63.5 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ...   | 12.1 |

|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.588   |

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|                                                                        | Troy grain. |
|------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                             | 6.39        |
| Additional Weight of Vapour required for complete saturation ...       | 3.09        |
| Mean degree of humidity for the month, complete saturation being unity | 0.67        |

|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 129.8 |

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|                                                                                                      | Inches. |
|------------------------------------------------------------------------------------------------------|---------|
| Rained 4 days,—Max. fall of rain during 24 hours ... ..                                              | 0.09    |
| Total amount of rain during the month ... ..                                                         | 0.14    |
| Total amount of rain indicated by the Gauge* attached to the anemo-<br>meter during the month ... .. | 0.05    |
| Prevailing direction of the Wind ... .. N. E. & E. N E.                                              |         |

\* Height 70 feet 10 inches above ground.



*Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of Nov. 1873.*

### MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

[illegible]

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of December 1873.*

Latitude  $22^{\circ} 33' 1''$  North. Longitude  $88^{\circ} 20' 34''$  East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Date. | Mean Height of<br>the Barometer<br>at $32^{\circ}$ Fahr. | Range of the Barometer<br>during the day. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture during the day. |      |       |
|-------|----------------------------------------------------------|-------------------------------------------|---------|---------|-------------------------------|-----------------------------------------------|------|-------|
|       |                                                          | Max.                                      | Min.    | Diff.   |                               | Max.                                          | Min. | Diff. |
|       | Inches.                                                  | Inches.                                   | Inches. | Inches. | °                             | °                                             | °    | °     |
| 1     | 30.002                                                   | 30.073                                    | 29.925  | 0.148   | 73.1                          | 81.5                                          | 66.8 | 14.7  |
| 2     | 29.990                                                   | .056                                      | .930    | .126    | 74.4                          | 82.7                                          | 66.5 | 16.2  |
| 3     | 30.013                                                   | .076                                      | .957    | .119    | 73.9                          | 78.6                                          | 70.4 | 8.2   |
| 4     | 29.996                                                   | .071                                      | .931    | .140    | 72.8                          | 80.4                                          | 67.5 | 12.9  |
| 5     | .990                                                     | .049                                      | .950    | .099    | 71.9                          | 80.5                                          | 68.1 | 17.4  |
| 6     | 30.019                                                   | .092                                      | .978    | .114    | 71.8                          | 80.0                                          | 64.8 | 15.2  |
| 7     | .024                                                     | .098                                      | .965    | .133    | 72.8                          | 80.6                                          | 66.5 | 14.1  |
| 8     | .036                                                     | .120                                      | .979    | .141    | 71.0                          | 77.2                                          | 66.8 | 10.4  |
| 9     | .032                                                     | .103                                      | .968    | .135    | 71.8                          | 81.5                                          | 64.6 | 16.9  |
| 10    | .051                                                     | .131                                      | .991    | .140    | 72.7                          | 82.5                                          | 64.5 | 18.0  |
| 11    | .062                                                     | .110                                      | 30.017  | .093    | 72.3                          | 78.0                                          | 69.0 | 9.0   |
| 12    | .093                                                     | .160                                      | .034    | .126    | 73.8                          | 80.0                                          | 70.0 | 10.0  |
| 13    | .089                                                     | .177                                      | .025    | .152    | 69.9                          | 77.8                                          | 68.0 | 14.8  |
| 14    | .044                                                     | .122                                      | 29.974  | .148    | 68.4                          | 77.0                                          | 61.9 | 15.1  |
| 15    | .066                                                     | .130                                      | 30.019  | .111    | 68.7                          | 78.5                                          | 61.0 | 17.5  |
| 16    | .107                                                     | .180                                      | .058    | .122    | 69.7                          | 78.4                                          | 62.5 | 15.9  |
| 17    | .119                                                     | .197                                      | .060    | .137    | 69.6                          | 78.0                                          | 61.5 | 16.5  |
| 18    | .059                                                     | .146                                      | 29.980  | .166    | 69.6                          | 78.4                                          | 62.5 | 15.9  |
| 19    | .000                                                     | .086                                      | .944    | .142    | 69.3                          | 78.5                                          | 61.6 | 16.9  |
| 20    | 29.996                                                   | .079                                      | .938    | .141    | 69.4                          | 78.3                                          | 62.2 | 16.1  |
| 21    | 30.055                                                   | .137                                      | 30.001  | .136    | 69.1                          | 78.5                                          | 61.0 | 17.5  |
| 22    | .072                                                     | .140                                      | .023    | .117    | 67.5                          | 76.5                                          | 59.0 | 17.5  |
| 23    | .051                                                     | .139                                      | 29.989  | .150    | 68.0                          | 77.5                                          | 60.9 | 16.6  |
| 24    | 29.996                                                   | .066                                      | .933    | .133    | 67.8                          | 78.0                                          | 60.0 | 18.0  |
| 25    | 30.004                                                   | .080                                      | .955    | .125    | 66.9                          | 77.8                                          | 57.5 | 20.3  |
| 26    | .009                                                     | .086                                      | .958    | .128    | 67.6                          | 78.3                                          | 58.0 | 20.3  |
| 27    | 29.966                                                   | .064                                      | .897    | .167    | 68.1                          | 79.6                                          | 58.5 | 21.1  |
| 28    | .911                                                     | 29.985                                    | .862    | .123    | 69.8                          | 80.0                                          | 61.5 | 18.5  |
| 29    | .951                                                     | 30.013                                    | .898    | .115    | 67.3                          | 74.0                                          | 61.2 | 12.8  |
| 30    | 30.004                                                   | .087                                      | .946    | .141    | 63.9                          | 71.5                                          | 57.8 | 13.7  |
| 31    | .015                                                     | .095                                      | .954    | .141    | 63.4                          | 73.3                                          | 55.5 | 17.8  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of December 1873.*

Daily Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued.)

| Date. | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satu-<br>ration being unity. |
|-------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| 1     | 68.2                            | 4.9                 | 64.3                | 8.8                          | 0.603                            | 6.60                                             | 2.19                                                                | 0.75                                                                |
| 2     | 69.7                            | 4.7                 | 66.4                | 8.0                          | .646                             | 7.06                                             | .09                                                                 | .77                                                                 |
| 3     | 67.4                            | 6.5                 | 62.8                | 11.1                         | .574                             | 6.27                                             | .74                                                                 | .70                                                                 |
| 4     | 64.5                            | 8.3                 | 57.9                | 14.9                         | .488                             | 5.33                                             | 3.38                                                                | .61                                                                 |
| 5     | 63.1                            | 8.8                 | 56.1                | 15.8                         | .459                             | .63                                              | .45                                                                 | .59                                                                 |
| 6     | 63.6                            | 8.2                 | 57.0                | 14.8                         | .473                             | .18                                              | .27                                                                 | .61                                                                 |
| 7     | 64.6                            | 8.2                 | 58.0                | 14.8                         | .489                             | .34                                              | .37                                                                 | .61                                                                 |
| 8     | 63.1                            | 7.9                 | 56.8                | 14.2                         | .470                             | .16                                              | .09                                                                 | .63                                                                 |
| 9     | 64.5                            | 7.3                 | 58.7                | 13.1                         | .501                             | .91                                              | 2.96                                                                | .65                                                                 |
| 10    | 67.5                            | 5.2                 | 63.3                | 9.4                          | .584                             | 6.39                                             | .29                                                                 | .74                                                                 |
| 11    | 69.8                            | 2.5                 | 67.8                | 4.5                          | .677                             | 7.41                                             | 1.17                                                                | .86                                                                 |
| 12    | 68.3                            | 5.5                 | 64.4                | 9.4                          | .605                             | 6.62                                             | 2.36                                                                | .74                                                                 |
| 13    | 63.3                            | 6.6                 | 58.0                | 11.9                         | .489                             | 5.38                                             | .60                                                                 | .67                                                                 |
| 14    | 61.2                            | 7.2                 | 55.4                | 13.0                         | .449                             | 4.95                                             | .67                                                                 | .65                                                                 |
| 15    | 62.3                            | 6.4                 | 57.2                | 11.5                         | .476                             | 5.24                                             | .45                                                                 | .68                                                                 |
| 16    | 62.6                            | 7.1                 | 56.9                | 12.8                         | .472                             | .18                                              | .75                                                                 | .65                                                                 |
| 17    | 63.5                            | 6.1                 | 58.6                | 11.0                         | .499                             | .50                                              | .40                                                                 | .70                                                                 |
| 18    | 63.8                            | 5.8                 | 59.2                | 10.4                         | .509                             | .62                                              | .28                                                                 | .71                                                                 |
| 19    | 63.8                            | 5.5                 | 59.4                | 9.9                          | .513                             | .64                                              | .19                                                                 | .72                                                                 |
| 20    | 63.4                            | 6.0                 | 58.6                | 10.8                         | .499                             | .50                                              | .36                                                                 | .70                                                                 |
| 21    | 61.9                            | 7.2                 | 56.1                | 13.0                         | .459                             | .06                                              | .72                                                                 | .65                                                                 |
| 22    | 60.2                            | 7.3                 | 54.4                | 13.1                         | .434                             | 4.79                                             | .63                                                                 | .65                                                                 |
| 23    | 61.3                            | 6.7                 | 55.9                | 12.1                         | .456                             | 5.04                                             | .49                                                                 | .67                                                                 |
| 24    | 61.2                            | 6.6                 | 55.9                | 11.9                         | .456                             | .04                                              | .44                                                                 | .67                                                                 |
| 25    | 60.2                            | 6.7                 | 54.8                | 12.1                         | .440                             | 4.86                                             | .42                                                                 | .67                                                                 |
| 26    | 61.4                            | 3.2                 | 56.4                | 11.2                         | .464                             | 5.12                                             | .32                                                                 | .69                                                                 |
| 27    | 62.9                            | 5.2                 | 58.7                | 9.4                          | .501                             | .54                                              | .01                                                                 | .73                                                                 |
| 28    | 64.4                            | 5.4                 | 60.1                | 9.7                          | .525                             | .77                                              | .18                                                                 | .73                                                                 |
| 29    | 62.5                            | 4.8                 | 53.7                | 8.6                          | .501                             | .54                                              | 1.83                                                                | .75                                                                 |
| 30    | 58.2                            | 5.7                 | 53.1                | 10.8                         | .415                             | 4.63                                             | 2.00                                                                | .70                                                                 |
| 31    | 58.2                            | 5.2                 | 53.5                | 9.9                          | .421                             | .69                                              | 1.84                                                                | .72                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of December 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.

| Hour.          | Mean Height of<br>the Barometer at<br>32° Fahr. | Range of the Barometer<br>for each hour during<br>the month. |         |         | Mean Dry Bulb<br>Thermometer. | Range of the Tempera-<br>ture for each hour<br>during the month. |      |       |
|----------------|-------------------------------------------------|--------------------------------------------------------------|---------|---------|-------------------------------|------------------------------------------------------------------|------|-------|
|                |                                                 | Max.                                                         | Min.    | Diff.   |                               | Max.                                                             | Min. | Diff. |
|                | Inches.                                         | Inches.                                                      | Inches. | Inches. | °                             | °                                                                | °    | °     |
| Mid-<br>night. | 30.032                                          | 30.123                                                       | 29.916  | 0.207   | 66.7                          | 73.4                                                             | 60.0 | 13.4  |
| 1              | .023                                            | .113                                                         | .906    | .207    | 66.1                          | 73.2                                                             | 58.8 | 14.4  |
| 2              | .014                                            | .107                                                         | .901    | .206    | 65.4                          | 72.7                                                             | 58.0 | 14.7  |
| 3              | .001                                            | .101                                                         | .893    | .208    | 64.8                          | 72.0                                                             | 57.5 | 14.5  |
| 4              | .002                                            | .115                                                         | .895    | .220    | 64.2                          | 71.8                                                             | 57.0 | 14.8  |
| 5              | .014                                            | .125                                                         | .910    | .215    | 63.7                          | 71.0                                                             | 56.0 | 15.0  |
| 6              | .030                                            | .138                                                         | .923    | .215    | 63.2                          | 70.8                                                             | 55.5 | 15.3  |
| 7              | .050                                            | .148                                                         | .936    | .212    | 62.9                          | 70.4                                                             | 55.5 | 14.9  |
| 8              | .071                                            | .172                                                         | .963    | .209    | 64.6                          | 71.0                                                             | 56.5 | 14.5  |
| 9              | .098                                            | .197                                                         | .985    | .212    | 68.4                          | 73.5                                                             | 61.2 | 12.3  |
| 10             | .100                                            | .195                                                         | .964    | .231    | 71.8                          | 77.5                                                             | 64.3 | 13.2  |
| 11             | .081                                            | .175                                                         | .946    | .229    | 64.6                          | 80.5                                                             | 66.3 | 14.2  |
| Noon.          | .050                                            | .138                                                         | .921    | .217    | 76.3                          | 81.2                                                             | 68.3 | 12.9  |
| 1              | .017                                            | .106                                                         | .906    | .200    | 77.5                          | 82.5                                                             | 70.0 | 12.5  |
| 2              | 29.990                                          | .079                                                         | .892    | .187    | 78.1                          | 82.7                                                             | 70.3 | 12.4  |
| 3              | .976                                            | .065                                                         | .862    | .208    | 78.3                          | 82.5                                                             | 71.5 | 11.0  |
| 4              | .970                                            | .060                                                         | .862    | .198    | 76.9                          | 81.3                                                             | 70.0 | 11.3  |
| 5              | .976                                            | .071                                                         | .863    | .208    | 75.4                          | 79.5                                                             | 69.0 | 10.5  |
| 6              | .990                                            | .077                                                         | .874    | .203    | 73.0                          | 78.0                                                             | 66.4 | 11.6  |
| 7              | 30.006                                          | .098                                                         | .886    | .212    | 71.3                          | 76.7                                                             | 65.0 | 11.7  |
| 8              | .022                                            | .119                                                         | .902    | .217    | 70.0                          | 76.0                                                             | 63.5 | 12.5  |
| 9              | .036                                            | .136                                                         | .916    | .220    | 68.8                          | 75.5                                                             | 62.5 | 13.0  |
| 10             | .043                                            | .129                                                         | .925    | .204    | 67.8                          | 74.5                                                             | 61.5 | 13.0  |
| 11             | .038                                            | .131                                                         | .920    | .211    | 67.1                          | 74.0                                                             | 60.5 | 13.5  |

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb  
Thermometer Means are derived from the observations made at the several  
hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of December 1873.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements  
dependent thereon.—(Continued).

| Hour.          | Mean Wet Bulb Ther-<br>mometer. | Dry Bulb above Wet. | Computed Dew Point. | Dry Bulb above Dew<br>Point. | Mean Elastic force of<br>Vapour. | Mean Weight of Vapour<br>in a Cubic foot of air. | Additional Weight of<br>Vapour required for<br>complete saturation. | Mean degree of Humi-<br>dity, complete satura-<br>tion being unity. |
|----------------|---------------------------------|---------------------|---------------------|------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|                | °                               | °                   | °                   | °                            | Inches.                          | T. gr.                                           | T. gr.                                                              |                                                                     |
| Mid.<br>night. | 63.0                            | 3.7                 | 60.0                | 6.7                          | 0.523                            | 5.79                                             | 1.44                                                                | 0.80                                                                |
| 1              | 62.4                            | 3.7                 | 59.4                | 6.7                          | .513                             | .68                                              | .42                                                                 | .80                                                                 |
| 2              | 61.8                            | 3.6                 | 58.9                | 6.5                          | .504                             | .59                                              | .36                                                                 | .80                                                                 |
| 3              | 61.3                            | 3.5                 | 58.5                | 6.3                          | .498                             | .53                                              | .30                                                                 | .81                                                                 |
| 4              | 60.8                            | 3.4                 | 57.7                | 6.5                          | .485                             | .38                                              | .31                                                                 | .80                                                                 |
| 5              | 60.3                            | 3.4                 | 57.2                | 6.5                          | .476                             | .29                                              | .30                                                                 | .80                                                                 |
| 6              | 60.0                            | 3.2                 | 57.1                | 6.1                          | .475                             | .30                                              | .19                                                                 | .82                                                                 |
| 7              | 59.7                            | 3.2                 | 56.8                | 6.1                          | .470                             | .25                                              | .18                                                                 | .82                                                                 |
| 8              | 60.6                            | 4.0                 | 57.4                | 7.2                          | .480                             | .33                                              | .45                                                                 | .79                                                                 |
| 9              | 62.2                            | 6.2                 | 57.2                | 11.2                         | .476                             | .25                                              | 2.37                                                                | .69                                                                 |
| 10             | 63.8                            | 8.0                 | 57.4                | 14.4                         | .490                             | .26                                              | 3.19                                                                | .62                                                                 |
| 11             | 65.3                            | 9.3                 | 58.8                | 15.8                         | .503                             | .47                                              | .73                                                                 | .60                                                                 |
| Noon.          | 65.8                            | 10.5                | 58.4                | 17.9                         | .496                             | .38                                              | 4.31                                                                | .56                                                                 |
| 1              | 66.2                            | 11.3                | 58.3                | 19.2                         | .494                             | .35                                              | .69                                                                 | .53                                                                 |
| 2              | 66.3                            | 11.8                | 58.0                | 20.1                         | .489                             | .29                                              | .93                                                                 | .52                                                                 |
| 3              | 66.4                            | 11.9                | 58.1                | 20.2                         | .491                             | .31                                              | .97                                                                 | .52                                                                 |
| 4              | 66.0                            | 10.9                | 58.4                | 18.5                         | .496                             | .37                                              | .49                                                                 | .56                                                                 |
| 5              | 66.0                            | 9.4                 | 59.4                | 16.0                         | .513                             | .58                                              | 3.85                                                                | .59                                                                 |
| 6              | 66.2                            | 6.8                 | 60.8                | 12.2                         | .537                             | .88                                              | 2.89                                                                | .67                                                                 |
| 7              | 65.5                            | 5.8                 | 60.9                | 10.4                         | .539                             | .92                                              | .41                                                                 | .71                                                                 |
| 8              | 65.0                            | 5.0                 | 61.0                | 9.0                          | .541                             | .95                                              | .05                                                                 | .74                                                                 |
| 9              | 64.3                            | 4.5                 | 60.7                | 8.1                          | .536                             | .90                                              | 1.81                                                                | .77                                                                 |
| 10             | 63.6                            | 4.2                 | 60.2                | 7.6                          | .527                             | .82                                              | .66                                                                 | .78                                                                 |
| 11             | 63.2                            | 3.9                 | 60.1                | 7.0                          | .525                             | .81                                              | .51                                                                 | .79                                                                 |

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of December 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge 1½ ft. above Ground. | WIND.                 |                |                 | General aspect of the Sky.                                                                                          |
|-------|-----------------------|---------------------------------|-----------------------|----------------|-----------------|---------------------------------------------------------------------------------------------------------------------|
|       |                       |                                 | Prevailing direction. | Max. Pressure. | Daily Velocity. |                                                                                                                     |
|       | °                     | Inches                          |                       | lb             | Miles.          |                                                                                                                     |
| 1     | 125.0                 | ...                             | E N E                 | ...            | 44.2            | ↘i & ↘i to 3 P. M. B to 11 P. M. Slightly foggy at 6 & 7 A. M.                                                      |
| 2     | 132.8                 | ...                             | E by N & E N E        | ...            | 97.9            | B to 6 A. M., ↘i to 11 A. M., ↘i to 4 P. M., ↘i to 11 P. M.                                                         |
| 3     | 102.0                 | ...                             | E N E & N E           | ...            | 151.6           | ↘i to 2 A. M. O to 11 P. M. D at 3 P. M.                                                                            |
| 4     | 123.0                 | ...                             | N E & N               | 0.5            | 174.6           | ↘i to 9 A. M., ↘i to 7 P. M., ↘i to 11 P. M.                                                                        |
| 5     | 130.0                 | ...                             | N E & N               | ...            | 168.2           | ↘i & ↘i                                                                                                             |
| 6     | 124.2                 | ...                             | N N E & N E           | ...            | 175.3           | ↘i                                                                                                                  |
| 7     | 129.0                 | ...                             | N E                   | ...            | 127.0           | ↘i to 10 A. M., ↘i to 11 P. M.                                                                                      |
| 8     | 127.7                 | ...                             | N E & E N E           | ...            | 98.6            | ↘i to 3 A. M. O to 5 A. M., ↘i to 10 A. M., ↘i to 3 P. M., ↘i to 5 P. M. B to 11 P. M.                              |
| 9     | 132.5                 | ...                             | E N E                 | ...            | 65.6            | B to 3 A. M., ↘i to 7 A. M. B to 11 A. M. ↘i to 6 P. M. B to 11 P. M. Slightly foggy from 7 to 9 P. M.              |
| 10    | 132.0                 | ...                             | E by N, E, & S        | ...            | 75.8            | B to 8 A. M., ↘i to 2 P. M. ↘i to 4 P. M. B to 11 P. M.                                                             |
| 11    | 118.5                 | 0.82                            | S, E S E & E N E      | ...            | 96.2            | S to 5 A. M. O to 11 P. M. R from 9½ to 11 A. M. & at 4½, 8, & 9 P. M.                                              |
| 12    | 126.0                 | ...                             | E N E                 | ...            | 107.5           | O to 1 A. M., ↘i to 8 A. M. B to 11 P. M.                                                                           |
| 13    | 130.0                 | ...                             | E N E & N by W        | ...            | 121.2           | B.                                                                                                                  |
| 14    | 130.0                 | ...                             | N N W & N by W        | ...            | 126.0           | B.                                                                                                                  |
| 15    | 129.0                 | ...                             | N N W & E N E         | ...            | 121.9           | B to 4 P. M., ↘i to 6 P. M., B to 11 P. M.                                                                          |
| 16    | 131.5                 | ...                             | E N E                 | ...            | 113.7           | B to 6 A. M., ↘i to 5 P. M. B to 11 P. M.                                                                           |
| 17    | 131.5                 | ...                             | E N E                 | ...            | 84.2            | B to 5 A. M., ↘i to 10 A. M. B to 4 P. M., ↘i to 9 P. M. B to 11 P. M. Slightly foggy at 5 & 6 A. M. & 9 & 10 P. M. |
| 18    | 130.0                 | ...                             | E N E                 | ...            | 73.4            | B to 6 A. M. ↘i to 6 P. M. B to 11 P. M. Slightly foggy at 10 & 11 P. M.                                            |

↘i Cirri,—i Strati, ↘i Cumuli, ↘i Cirro-strati, ~i Cumulo-strati, ~i Nimbi,  
↘i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning,  
R rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of December 1873.*

Solar Radiation, Weather, &c.

| Date. | Max. Solar radiation. | Rain Gauge<br>1½ ft. above<br>Ground. | WIND.                 |               |                 | General aspect of the Sky.                                                           |
|-------|-----------------------|---------------------------------------|-----------------------|---------------|-----------------|--------------------------------------------------------------------------------------|
|       |                       |                                       | Prevailing direction. | Max. Pressure | Daily Velocity. |                                                                                      |
|       | °                     | Inches                                |                       | lb            | Mile.           |                                                                                      |
| 19    | 130.5                 | ...                                   | ENE                   | ...           | 77.9            | B to 11 A. M., $\wedge$ i to 1 P. M. B to 11 P. M. Slightly foggy from 9 to 11 P. M. |
| 20    | 133.4                 | ...                                   | ENE & NE              | ...           | 62.5            | B to 11 A. M., $\wedge$ i to 3 P. M. B to 11 P. M.                                   |
| 21    | 132.5                 | ...                                   | NE                    | 0.4           | 116.8           | B to 12 A. M., $\wedge$ i to 2 P. M. B to 11 P. M. Slightly foggy at 6 & 7 A. M.     |
| 22    | 127.0                 | ...                                   | NE & NNW              | ...           | 42.7            | B.                                                                                   |
| 23    | 128.0                 | ...                                   | N & NE                | ...           | 199.9           | B to 12 A. M., $\wedge$ i to 3 P. M. B to 11 P. M.                                   |
| 24    | 131.7                 | ...                                   | NE                    | ...           | 149.1           | B.                                                                                   |
| 25    | 130.0                 | ...                                   | NE & E                | ...           | 81.5            | B. Slightly foggy from at 7 & 8 A. M.                                                |
| 26    | 133.7                 | ...                                   | E                     | ...           | 56.5            | B. Slightly foggy from 6 to 8 A. M. & 7 to 11 P. M.                                  |
| 27    | 129.0                 | ...                                   | E & SW                | ...           | 47.1            | B. Slightly foggy from 5 to 7 A. M.                                                  |
| 28    | 136.0                 | ...                                   | SW & SSW              | ...           | 117.5           | B to 1 P. M., $\wedge$ i to 4 P. M. B to 8 P. M., $\wedge$ i to 11 P. M.             |
| 29    | 125.5                 | ...                                   | SSW, NNW & N          | ...           | 138.7           | $\wedge$ i to 6 A. M. B to 12 A. M. $\wedge$ i to 5 P. M. B to 11 P. M.              |
| 30    | 128.0                 | ...                                   | NNE & N by W          | ...           | 143.7           | B. Slightly foggy from 9 to 11 P. M.                                                 |
| 31    | 127.0                 | ...                                   | N by W & WNW          | ...           | 89.3            | B. Slightly foggy at midnight & 1 from 6 to 10 A. M. & 8 to 11 P. M.                 |

$\wedge$  i Cirri, — i Strati,  $\wedge$  i Cumuli,  $\wedge$  i Cirro-strati,  $\wedge$  i Cumulo-strati,  $\wedge$  i Nimbi,  $\wedge$  i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning R. rain, D drizzle.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta,  
in the month of December 1873.*

MONTHLY RESULTS.

|                                                                      | Inches. |
|----------------------------------------------------------------------|---------|
| Mean height of the Barometer for the month ... ..                    | 30.027  |
| Max. height of the Barometer occurred at 9 A. M. on the 17th ...     | 30.197  |
| Min. height of the Barometer occurred at 3 & 4 P. M. on the 28th ... | 29.862  |
| Extreme range of the Barometer during the month ... ..               | 0.335   |
| Mean of the daily Max. Pressures ... ..                              | 30.102  |
| Ditto ditto Min. ditto ... ..                                        | 29.969  |
| Mean daily range of the Barometer during the month ... ..            | 0.133   |

|                                                             | °    |
|-------------------------------------------------------------|------|
| Mean Dry Bulb Thermometer for the month ... ..              | 69.9 |
| Max. Temperature occurred at 2 P. M. on the 2nd ... ..      | 82.7 |
| Min. Temperature occurred at 6 & 7 A. M. on the 31st ... .. | 55.5 |
| Extreme range of the Temperature during the month ... ..    | 27.2 |
| Mean of the daily Max. Temperature ... ..                   | 78.5 |
| Ditto ditto Min. ditto, ... ..                              | 62.8 |
| Mean daily range of the Temperature during the month ... .. | 15.7 |

|                                                                |      |
|----------------------------------------------------------------|------|
| Mean Wet Bulb Thermometer for the month ... ..                 | 63.6 |
| Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ...  | 6.3  |
| Computed Mean Dew-point for the month ... ..                   | 58.6 |
| Mean Dry Bulb Thermometer above computed mean Dew-point ... .. | 11.3 |

|                                                   | Inches. |
|---------------------------------------------------|---------|
| Mean Elastic force of Vapour for the month ... .. | 0.499   |

|                                                                        | Troy grain. |
|------------------------------------------------------------------------|-------------|
| Mean Weight of Vapour for the month ... ..                             | 5.50        |
| Additional Weight of Vapour required for complete saturation ... ..    | 2.48        |
| Mean degree of humidity for the month, complete saturation being unity | 0.69        |

|                                                            | °     |
|------------------------------------------------------------|-------|
| Mean Max. Solar radiation Thermometer for the month ... .. | 128.3 |

|                                                                                                 | Inches. |
|-------------------------------------------------------------------------------------------------|---------|
| Rained 2 days.—Max. fall of rain during 24 hours ... ..                                         | 0.82    |
| Total amount of rain during the month ... ..                                                    | 0.82    |
| Total amount of rain indicated by the Gauge* attached to the anemometer during the month ... .. | 0.73    |
| Prevailing direction of the Wind ... .. E. N. E. & N E.                                         |         |

\* Height 70 feet 10 inches above ground.





# INDEX.

---

|                                                                    | <i>Page</i> |
|--------------------------------------------------------------------|-------------|
| Abbey (Mr. W.), Death of, ... ..                                   | 23          |
| 'Abdullah bin Ibádh, ... ..                                        | 35          |
| 'Abd-un-nabi Khán, Builder of the Mathurá Mosque, ... ..           | 12          |
| Abd-un-nabi Khán, a partizan of Dará Shikoh, ... ..                | 12          |
| Aboriginal Races, in Dalton's Ethnology, Identification of, ... .. | 82          |
| Accounts, Abstracts of, ... ..                                     | xviii—xxxii |
| Acrophylla violascens, ... ..                                      | 150         |
| Address, President's, ... ..                                       | 41          |
| Aitareya Aranyaka, publication of sanctioned, ... ..               | 196         |
| Ajmír, Inscriptions of Jahángír, from ... ..                       | 159         |
| Akbar Inscription, from Amrohah, ... ..                            | 90          |
| 'Aláuddín Khilji Inscription from Rápri, ... ..                    | 156         |
| Allah Virdi Khán, tuyáldár of Mathura, A. H. 1048, ... ..          | 15          |
| Allen (Mr. J.), Election of, ... ..                                | 1           |
| Amdapúr (W. Berar), Temple at, ... ..                              | 67          |
| Amrohah, Inscriptions from Mosque and Fort of, ... ..              | 101         |
| Andamanese, Photographs of, ... ..                                 | 118         |
| „ Reptiles, Notes on, ... ..                                       | 118         |
| Anderson (Dr. J.), on the Mundas, ... ..                           | 132         |
| „ (Mr. A.), on a New Kite, ... ..                                  | 134         |
| Aquila bifasciata, ... ..                                          | 173         |
| „ fulvescens, ... ..                                               | 173         |
| „ imperialis, ... ..                                               | 173         |
| „ mogilnik, ... ..                                                 | 173         |
| „ nævioides, ... ..                                                | 173         |
| „ vindhiana, ... ..                                                | 173         |
| Arjun Deo, Governor of Sonpat, ... ..                              | 95          |
| Ashton (Rev. J. P.), Withdrawal of ... ..                          | 88          |
| Atkinson (Mr. W. S.), Trustee for the Society, ... ..              | 29          |
| Auditors, Election of, ... ..                                      | 41          |
| Bábar Inscription, from Sambhal, ... ..                            | 90          |
| Bacillus, Notes on Species of, ... ..                              | 148         |
| „ carinulatus, ... ..                                              | 149         |
| „ cunicularis, ... ..                                              | 149         |
| „ furcillatus, ... ..                                              | 149         |

|                                                                      | Page     |
|----------------------------------------------------------------------|----------|
| <i>Bacillus humilis</i> , ... ..                                     | 149      |
| „ hyphereon, ... ..                                                  | 149      |
| „ insignis, ... ..                                                   | 148      |
| „ <i>Penthesilea</i> , ... ..                                        | 149      |
| „ <i>ramosus</i> , ... ..                                            | 149      |
| „ <i>Rossii</i> , ... ..                                             | 149      |
| „ <i>scabriusculus</i> , ... ..                                      | 149      |
| „ <i>scytale</i> , ... ..                                            | 149      |
| „ <i>Westwoodi</i> , ... ..                                          | 149      |
| Badáon, Inscriptions from, ... ..                                    | 199      |
| Badáoní, Translation of, ... ..                                      | 94       |
| Baddibati, Wood dug out at, ... ..                                   | 78       |
| Badgley (Capt. W. F.), Election of, ... ..                           | 155      |
| Balban, Inscriptions of, from Sonpat, ... ..                         | 90, 94   |
| Ball (Mr. V.), on Wolf-reared Children, ... ..                       | 128      |
| Banerjea (Bábú Satyadayála), Election of, ... ..                     | 79       |
| „ .. (Bábú Rangalála), on Identification of Aboriginal Races, ... .. | 82       |
| Bannagar, Pillar of, ... ..                                          | 87       |
| Bárbak Sháh, Rukn uddín Abul Mujáhid, king of Bengal, ... ..         | 21       |
| Barclay (Mr. G. W.), Election of, ... ..                             | 79       |
| Bashír uddín (Sultan Muhammad), Withdrawal of ... ..                 | 172      |
| Bassein Temples (W. Berar), Photographs of, ... ..                   | 66       |
| Batavia, Antiquities of, ... ..                                      | 153      |
| Bate (Rev. J. D.), Election of, ... ..                               | 1        |
| Batrachia, Type specimens of, ... ..                                 | 110      |
| Báurís, of Bánkurah, the ... ..                                      | 202      |
| Baxter (Dr. J. B.), Withdrawal of, ... ..                            | 196      |
| Bayley (the Hon. E. C.), Notes on two coins from Kausambhi, ... ..   | 72, 82   |
| „ „ on two Muhammadan Gold Coins, ... ..                             | 186, 202 |
| Bayne (Mr. R. R.), Election of, ... ..                               | 46       |
| Beale (Mr. T. W.), Inscriptions from Agrah, Biánah and Ajmir, ... .. | 159      |
| Beames (Mr. J.), on Chand's Grammar, ... ..                          | 18       |
| „ „ on the Text of Chand, ... ..                                     | 122      |
| Bengal, Climate of, ... ..                                           | 178      |
| „ „ Invasion of, ... ..                                              | 19       |
| „ „ Sanscrit and Muhammadan Inscriptions from, ... ..                | 17       |
| Bhádu, festival of, ... ..                                           | 202      |
| Biánah, (Dist. Bhartpúr), Inscriptions from, ... ..                  | 159      |
| Bibliotheca Indica, Report on, ... ..                                | 31       |
| Bingham (Mr. C. T.), Election of, ... ..                             | 155      |
| Bird (Mr. C. P.), Election cancelled, ... ..                         | 1        |

|                                                                | <i>Page</i> |
|----------------------------------------------------------------|-------------|
| Birsingh Deo Bundela's temple at Mathura destroyed, ...        | 15          |
| Blackburn, (Mr. J.), Election of, ...                          | 195         |
| Bladder Worms, Report on, ...                                  | 57, 64      |
| Blanford. (Mr. H. F.), on Stone Monuments, ..                  | 130         |
| "        a Trustee for the Society, ...                        | 29          |
| "        on Húgli Water, ...                                   | 177         |
| "        on the Climate of Bengal, ...                         | 178         |
| "        (Mr. W. T.), Note on the genus <i>Gymnops</i> , ...   | 118         |
| Bligh (Mr. W. G.), Election of, ...                            | 155         |
| Blissett (Mr. T. T.), Election of, ...                         | 87          |
| Blochmann (Mr. H.), Notes on Bengal Coins, ...                 | 89          |
| "        on Bengal Inscriptions, ...                           | 17          |
| "        on Coin of Balhan, ...                                | 93          |
| "        on Coin of Firúz Sháh, ...                            | 171         |
| "        on Coins of Qutbuddín and Mu'izzuddín, ...            | 155         |
| "        on Inscriptions from Mathurá, ...                     | 12          |
| "        on Inscriptions from Ráprí, ...                       | 156         |
| "        on Inscriptions from Soupat and Murádábád, ..         | 94          |
| "        on Rustam Khán Dak'hiní, ...                          | 90          |
| "        on Shaikh Mírá, ...                                   | 11          |
| "        on Sunárgáo, ...                                      | 93          |
| Bourke (Mr. W. M.), inscriptions from Rájmahall, ...           | 90          |
| Brihaddhevata, publication of, sanctioned, ...                 | 196         |
| Brooks (Mr. W. E.), Contributions of, ...                      | 55          |
| "        Notes on Eagles, ...                                  | 173         |
| "        on Certhiinae, ...                                    | 175         |
| "        on the genus <i>Milvus</i> , ...                      | 142         |
| "        on Indian Eagles, ...                                 | 118         |
| Bú 'Alí Qalandar, of Panípat, ...                              | 97          |
| Burmah, Archaeological Remains of, ...                         | 87          |
| Burmese Algæ, ...                                              | 119         |
| "        Palms, Notes on, ...                                  | 186, 202    |
| Butler (Capt. J.), Re-election of, ...                         | 155         |
| Cadell (Mr. A.), inscriptions from Muzaffarnagar District, ... | 141         |
| Cappel (Mr. A.), Election of, ...                              | 79          |
| Carcinus mænas, exhibited, ...                                 | 172         |
| Carleton (Rev. Mr.), Coins from Rupúr, ...                     | 155         |
| Celt from the Narbada Valley, ...                              | 138         |
| Certhiinae of India, Notes on the, ...                         | 175         |
| Challenger, Expedition of the, ...                             | 62          |
| Champanagar (near Bhágalpúr), inscriptions from, ...           | 200         |

|                                                                      | <i>Page</i>       |
|----------------------------------------------------------------------|-------------------|
| Chand Bardai, Grammar of, ... ..                                     | 90, 89            |
| "    Edition of, ... ..                                              | 122               |
| "    Metrical Translation of, ... ..                                 | 118               |
| Chandangpha, of Ásám, invades Bengal, ... ..                         | 19                |
| Chiromeles, ... ..                                                   | 110               |
| Chokahatu Burial Ground, Photographs of, ... ..                      | 180               |
| Cholera, Microscopic Researches on, ... ..                           | 64                |
| Chutiá Nágpúr, Rude Stone Monuments in, ... ..                       | 130               |
| Coin Cabinet, Report on, ... ..                                      | 31                |
| Coin of Firúz Sháh II, of Bengal, ... ..                             | 171               |
| Coins, Bengal, notes on, ... ..                                      | 89                |
| "    gold, Muhammadan, ... ..                                        | 94                |
| "    Greek, Electrotypes of, ... ..                                  | 94                |
| "    from Kausambhi, Notes on, ... ..                                | 82                |
| "    of Mu'izz, Balban, and Muhammad Tughluq, ... ..                 | 93                |
| "    of Mu'izzuddin Mubárák Sháh, ... ..                             | 155               |
| "    of Qutbuddin Mubárák Sháh, ... ..                               | 155               |
| Committees, Election of, ... ..                                      | 155               |
| Communications received, ... ..                                      | 72, 90, 18, 134   |
| Council, Election of, ... ..                                         | 41                |
| "    Election of Members of, ... ..                                  | 88, 121, 196      |
| Couch (Sir R.), Withdrawal of, ... ..                                | 172, 197          |
| Cunningham (General A.), Inscriptions from, ... ..                   | 17, 138, 156, 197 |
| "    (Mr. D. D.), Election of, ... ..                                | 155               |
| Curtoys (Mr. J. W.), Withdrawal of, ... ..                           | 79                |
| Cynonycteris amplexicaudatus, ... ..                                 | 148               |
| "    minor, ... ..                                                   | 148               |
| Cynopterus andamanensis, ... ..                                      | 148               |
| "    marginatus, ... ..                                              | 148               |
| "    Sherzeri, ... ..                                                | 148               |
| Cyphocrania Enceladus, ... ..                                        | 150               |
| "    Goliath, ... ..                                                 | 150               |
| Dalton (Col. E. T.), on Rude Stone Monuments in Chutiá Nágpúr, ..    | 130               |
| Dames (M. L. Esq.), Election of, ... ..                              | 195               |
| Daryá Khán Lodi, ... ..                                              | 96                |
| "    Khán Shirwání, of Sonpat, ... ..                                | 96                |
| Day (F.), on Indian Cyprinidæ, ... ..                                | 54                |
| Delmerick (Mr. J. G.), Inscriptions from Sonpat and Pá nipat, ... .. | 94                |
| "    Inscriptions from Hariyáná and Nádáyana, ... ..                 | 102               |
| "    Inscriptions from Pá nipat, ... ..                              | 140               |
| Denison (Sir W.), Death of, ... ..                                   | 28                |

|                                                                        | Page     |
|------------------------------------------------------------------------|----------|
| Dennys (Mr. H. L.), Election of, ... ..                                | 1        |
| Devagiri Rājals, ... ..                                                | 71       |
| Dhotra (W. Berar), Temple at, ... ..                                   | 70       |
| Dihlī, Inscriptions from, ... ..                                       | 158, 197 |
| Dināpūr, (Āsām), Ruins of, ... ..                                      | 186, 202 |
| Dinājpūr, Photographs of the Antiquities of, ... ..                    | 75, 87   |
| Diploplema Berdmorei, ... ..                                           | 112      |
| "    pulehrum, ... ..                                                  | 112      |
| Dobson (Dr. G. E.), on a Double-headed Snake, ... ..                   | 23       |
| "    on Indian Pteropidæ, ... ..                                       | 147      |
| "    on Molossi, ... ..                                                | 110      |
| "    on Molossus (Nyctinomus), ... ..                                  | 22       |
| "    on the genera Murina and Harpyiocephalus of Gray, ... ..          | 90, 107  |
| "    on Vespertilio, ... ..                                            | 148      |
| Dotáná near Mathurá, ... ..                                            | 81       |
| Drummond (Col. H.), Election of, ... ..                                | 1        |
| "    Election Cancelled, ... ..                                        | 64       |
| Durand (Mr. H. M.), Election of, ... ..                                | 137      |
| Dutt (Babu Jogeschandra), Election of, ... ..                          | 155      |
| "    (Babu Umeschandra), Election of, ... ..                           | 87       |
| Earthquake, in Kámrúp, ... ..                                          | 65       |
| East African dialects, works in, ... ..                                | 79       |
| Elliot (Mr. J.), Election of, ... ..                                   | 195      |
| Engystoma Berdmorei, ... ..                                            | 112      |
| Ethnology of Bengal, Col. Dalton's, ... ..                             | 53       |
| Extatosoma tiaratum, ... ..                                            | 150      |
| Faríd i Bukhārī, Tomb of, at Dihlī, ... ..                             | 197      |
| Fath Sháh, Jalál-uddín Abul Muzaffar, king of Bengal, ... ..           | 21       |
| Finance, Report on, ... ..                                             | 29       |
| Fírúz Sháh, 'Alá-uddín Abul Muzaffar, king of Bengal, ... ..           | 22       |
| Fírúz Sháh II of Bengal, Cast of a Coin of, ... ..                     | 171      |
| Fírúz Sháh, Inscription of, at Dihlī. ... ..                           | 158      |
| Fírúz Sháh, Shams-uddín Abul Muzaffar, king of Bengal, ... ..          | 20       |
| Ford (Col. B.), Withdrawal of, ... ..                                  | 172      |
| Fraser (Capt. E. A.), Election of, ... ..                              | 137      |
| Ganga Parshád, Inscriptions from Sambhal, Murádábád and Amroha, 90, 98 |          |
| Gamble (Mr. J. S.), Election of, ... ..                                | 198      |
| Gastrell (Col. J. E.), a Trustee for the Society, ... ..               | 29, 138  |
| Gauja Agrahar Sāsana, Transcript of, ... ..                            | 75       |
| Geddes (Mr. J. C.), Withdrawal of, ... ..                              | 64       |

|                                                                       | <i>Page</i> |
|-----------------------------------------------------------------------|-------------|
| Geoghegan (Mr. J.), Elected Member of Council, ... ..                 | 196         |
| Ghiyásuddín Balban, ... ..                                            | 95          |
| Ghiyásuddín Tughluq, Inscription at Mahobá, ... ..                    | 156         |
| Ghoshá (Pratápachandra), on General Cunningham's Inscriptions, ... .. | 118         |
| "    on Sambalpúr Inscription, ... ..                                 | 90          |
| Gill (Major), on Hemadpauti Temples in Berar, ... ..                  | 66          |
| Godwin-Austen (Major H. H.), on Ruins of Dimápur, ... ..              | 186, 202    |
| Goldsticker (Prof. T.), Death of, ... ..                              | 28, 47      |
| Gough (Mr. A. E.), Withdrawal of, ... ..                              | 1           |
| Griffith (Mr. R. T. H.), Withdrawal of, ... ..                        | 196         |
| Growse (Mr. F. S.), Metrical Translations from Chand, ... ..          | 118         |
| "    on Mathurá Inscriptions, ... ..                                  | 12          |
| "    on Populations of Dotáná, near Mathurá, ... ..                   | 81          |
| Gymnops, Notes on, ... ..                                             | 118         |
| Hæmatozoon, Report on, ... ..                                         | 56, 64      |
| Haldár (Bábu Rakhaldás), Withdrawal of, ... ..                        | 1           |
| Harpyiocephalus, Notes on, ... ..                                     | 107         |
| Harting's system of Zoological nomenclature ... ..                    | 114         |
| Hasan 'Alí Khán, Faujdár of Mathurá, ... ..                           | 14          |
| Havelí, district Jasar, identification of, ... ..                     | 90          |
| Hector (the Rev. J.), Election of, ... ..                             | 94          |
| Hemadpauti Temples in W. Berar, Notes on, ... ..                      | 66          |
| History of the Portuguese in India, Authorities for the, ... ..       | 150         |
| Horne (Mr. C.), Death of, ... ..                                      | 28, 47      |
| House Allowance granted, ... ..                                       | 81          |
| Houstoun (Mr. G. L.), Election of, ... ..                             | 1           |
| Hughes (Mr. A. J.), Election of, ... ..                               | 79          |
| Húgli Water, Filtration of, during the Rainy season, ... ..           | 162, 175    |
| Husain Sháh, 'Alá-uddín Abul Muzaffar, king of Bengal, ... ..         | 21          |
| Hyde (Col. H. E.), Elected President, ... ..                          | 88          |
| Hylæocarcinus Humei, ... ..                                           | 161         |
| Hylorana erythræa, ... ..                                             | 111         |
| Ibádli sect of 'Omán, Tenets of the, ... ..                           | 2           |
| Ibráhm Lodi, Inscriptions of, from Sonpat, ... ..                     | 90          |
| Index Geographicus, ... ..                                            | 51          |
| Inscription from 'Abdurrashíd's mosque in Mathurá, ... ..             | 16          |
| "    copper-plate, from Báqirganj, ... ..                             | 171         |
| "    of Govindachandra, of Kanauj, ... ..                             | 150, 161    |
| Inscriptions from Jaunpúr, Pánipat and Muzaffarnagar, ... ..          | 138         |
| "    from Sarabala, Hariyáná District, ... ..                         | 102         |
| "    Persian and Hindústání from Mathurá, ... ..                      | 12          |

|                                                                  | <i>Page</i> |
|------------------------------------------------------------------|-------------|
| Inscriptions from Ráprí, Mahobá, Dihlí, Biánah, Ajmír and Ágrah, | 156, 197    |
| „ Sanscrit and Muhammadan from Bengal, ... ..                    | 17          |
| „ from Sonpat, Sambhal, Amrohal, Silliat and Rájmahall,          | 90, 94      |
| „ on the mosque of Rustam Khán Dák'hiní, Muridábád, ..           | 99          |
| „ on the tomb of Bú 'Alí Qalander Pánípat, ... ..                | 97          |
| „ on the tomb of Shaikh Miná, Lakhnau, ... ..                    | 11          |
| Institutions Exchanging Publications, List of, ... ..            | 39          |
| Ismá'il Beg's tomb at Ágrah, ... ..                              | 160         |
| Itáwáh, 'Abduunnabí Khán, Faujdár of, ... ..                     | 13          |
| Já'ad, Sheikh, unites the sects of the Ibádhis, ... ..           | 4           |
| Ja'far, Faujdár of Mathurá, ... ..                               | 13          |
| Jahmiyeh Sect, the, ... ..                                       | 5           |
| Jaipúr Kotlí (W. Berar), Temple at, ... ..                       | 66          |
| Jaunpúr Inscription, ... ..                                      | 189         |
| Java, Hindu antiquities of, ... ..                               | 153         |
| Jerdonia agricolensis, ... ..                                    | 147         |
| Jerdon (Dr. T. C.), Death of, ... ..                             | 28, 46      |
| Johnston (Mr. J. W.), Election of, ... ..                        | 121         |
| Johore (Maharaja of), Election of, ... ..                        | 195         |
| Johore, Molossus (Nyctinomus) from, ... ..                       | 22          |
| Jones (Mr. F.), Election of, ... ..                              | 87          |
| Journal, Report on, ... ..                                       | 31          |
| Kádíríyeh Sect, the, ... ..                                      | 5           |
| Kai Káús Ruknuddin, king of Bengal, ... ..                       | 20          |
| Kámrúp, Earthquake in, ... ..                                    | 65          |
| Kanauj, Inscription from, ... ..                                 | 200         |
| Kanis or Kansa, Hindú king of Bengal, ... ..                     | 18          |
| Kaup's system of Zoological classification, ... ..               | 113         |
| Keshf-ul-Ghumme, ... ..                                          | 2           |
| Khárijites, Doctrines of the, ... ..                             | 3           |
| Khwájah Khizr Khán's Dargah, Sonpat, ... ..                      | 94          |
| Khawárij Sect, the ... ..                                        | 5           |
| Koppa Gadde Sásanas, Transcript of, ... ..                       | 76          |
| Kurz (Mr. S.), on Burmese Palms, ... ..                          | 186, 202    |
| Laidlay (Mr. J. W), Death of, ... ..                             | 28          |
| Lamb (Major), on Earthquake in Kámrúp, ... ..                    | 65          |
| Land-crab from the Nicobar Islands, ... ..                       | 161         |
| Lectures, Programme of, ... ..                                   | 196         |
| Lewin (Capt. T.), Withdrawal of, ... ..                          | 196         |
| Lewis (Dr. T. R.), Election of, ... ..                           | 64          |
| „ Works of, ... ..                                               | 56          |



|                                                                         | <i>Page</i>                                |     |     |        |
|-------------------------------------------------------------------------|--------------------------------------------|-----|-----|--------|
| Library, Additions to the, ...                                          | 24, 72, 83, 91, 119, 134, 151, 163, 205    |     |     |        |
| „ Report on, ...                                                        | ...                                        | ... | ... | 31     |
| Lonar (W. Berar), Temple and Lake at, ...                               | ...                                        | ... | ... | 68     |
| Lonchodes insignis, ...                                                 | ...                                        | ... | ... | 149    |
| „ pseudoporus, ...                                                      | ...                                        | ... | ... | 149    |
| „ Russellii, ...                                                        | ...                                        | ... | ... | 149    |
| „ stilpnus, ...                                                         | ...                                        | ... | ... | 149    |
| Lopaphus coccophagus, ...                                               | ...                                        | ... | ... | 150    |
| Lycodon aulicus, ...                                                    | ...                                        | ... | ... | 23     |
| Mackay (Mr. W.), Election of, ...                                       | ...                                        | ... | ... | 94     |
| Macroglossus spelæus, ...                                               | ...                                        | ... | ... | 148    |
| Macleod (Sir D. F.), Death of, ...                                      | ...                                        | ... | ... | 28, 47 |
| Mahkar, (W. Berar), Temple at, ...                                      | ...                                        | ... | ... | 68     |
| Mahmúd Sháh, Ghiyás-uddín Abul Muzaffar, king of Bengal, ...            | ...                                        | ... | ... | 22     |
| Mahmúd Sháh, Násir-uddín Abul Mujáhid, king of Bengal, ...              | ...                                        | ... | ... | 21     |
| Mahmúd Sháh, Násir-uddín Abul Muzaffar, king of Bengal, ...             | ...                                        | ... | ... | 21     |
| Mahobá, Inscription from, ...                                           | ...                                        | ... | ... | 156    |
| Mainwaring (Col.), on the term Mún, Mwon or Món, ...                    | ...                                        | ... | ... | 133    |
| Marshall (Mr. C. W.), Election of, ...                                  | ...                                        | ... | ... | 137    |
| Marshall (Col. W. E.), Election of, ...                                 | ...                                        | ... | ... | 155    |
| Maryam Zamání, mother of Jahángir, ...                                  | ...                                        | ... | ... | 159    |
| Mathurá, 'Abdunnabi Khán's Mosque at, ...                               | ...                                        | ... | ... | 12     |
| „ Aurangzib's Crusade against, A. H. 1080, ...                          | ...                                        | ... | ... | 14     |
| „ called Islámábád, ...                                                 | ...                                        | ... | ... | 15     |
| „ rebellion in, A. H. 1079, ...                                         | ...                                        | ... | ... | 13     |
| Mayo (Rt. Hon. Earl), Death of, ...                                     | ...                                        | ... | ... | 28, 45 |
| McLeod (Dr. K.), Election of, ...                                       | ...                                        | ... | ... | 195    |
| Medlicott, (Mr. H. B.), on stone implement from the Narbadá Valley, ... | ...                                        | ... | ... | 138    |
| „ elected a Member of Council, ...                                      | ...                                        | ... | ... | 196    |
| Meeting, Annual, ...                                                    | ...                                        | ... | ... | 27     |
| „ Monthly General, ...                                                  | 1, 64, 75, 87, 93, 121, 137, 153, 171, 195 |     |     |        |
| Megalophrys gigas, ...                                                  | ...                                        | ... | ... | 111    |
| Melville (Capt. A. B.), Death of, ...                                   | ...                                        | ... | ... | 28     |
| Members, Election of, ...                                               | 1, 64, 79, 94 121, 137, 155, 195           |     |     |        |
| „ List of, ...                                                          | ...                                        | ... | ... | I      |
| „ Proposed, Ordinary, ...                                               | 1, 64, 79, 87, 94, 121, 137, 172, 195      |     |     |        |
| „ Withdrawal of, ...                                                    | 1, 64, 79, 121, 156, 172, 196              |     |     |        |
| Meteorological Reports, ...                                             | ...                                        | ... | ... | I      |
| Milvus, Mr. A. Anderson on the genus, ...                               | ...                                        | ... | ... | 142    |
| „ affinis, ...                                                          | ...                                        | ... | ... | 143    |
| „ govinda, ...                                                          | ...                                        | ... | ... | 143    |

|                                                             | <i>Page</i> |
|-------------------------------------------------------------|-------------|
| Milvus, major, ... ..                                       | 143         |
| " melanotis, ... ..                                         | 145         |
| " migrans, ... ..                                           | 145         |
| " palustris, ... ..                                         | 143         |
| Mitra (Bábú Rajendralala), on Kanauj Inscriptions, ...      | 150, 161    |
| " on Sarbal and Nárain inscriptions, ...                    | 102         |
| Molossi, Asiatic Species of, ... ..                         | 110         |
| Molossus (Nyctinomus), remarkable new species of, ...       | 22          |
| Mornah (Muzaffarnagar), Mosque at, ... ..                   | 142         |
| Moteyelízeh Sect, the, ... ..                               | 5           |
| Muhammad 'ibn Tughluq, ... ..                               | 199         |
| Mukerjea (N. C.), on Bhádu and the Bauris, ... ..           | 202         |
| Mundás of Chutia Nágpúr, ... ..                             | 132         |
| Mún or Món races of Pegu, ... ..                            | 133         |
| Muqarrab Khán, of Pánípat, ... ..                           | 97          |
| Murádábád Mosque, Inscription from, ... ..                  | 99          |
| Murina genus, Notes on the, ... ..                          | 107         |
| Murshid Qulí Khán, Faujdár of Mathurá, A. H. 1045, ...      | 15          |
| Museum, Report on, ... ..                                   | 23          |
| Mu'izz-uddín Mubárah Sháh, Coin of, ... ..                  | 155         |
| Muzaffarnagar, Inscriptions from, ... ..                    | 141         |
| Muzaffar Sháh, Shams-uddín Abul Nasr, king of Bengal, ...   | 21          |
| Mu'izz Balban, Coin of, ... ..                              | 93          |
| Nádáyana, near Indraprastha, Inscription from, ... ..       | 104         |
| Najd tribes, the, adopt Wahhábi religion, ... ..            | 4           |
| Naja tripudians, double headed, ... ..                      | 23          |
| Newman (Dr. J. H.), Withdrawal of, ... ..                   | 64          |
| Nicobarese Reptiles, Notes on, ... ..                       | 118         |
| Nur-uddín Jahángír, Inscription at Biánah, ... ..           | 159         |
| Nusrat Sháh, Násir-uddín Abul Muzaffar, king of Bengal, ... | 22          |
| Nyctinomus, ... ..                                          | 110         |
| " insignis, ... ..                                          | 110         |
| " plicatus, ... ..                                          | 22          |
| " fragatus, ... ..                                          | 110         |
| " Johorensis, ... ..                                        | 22          |
| O'Brien (Mr. B.), Election of, ... ..                       | 195         |
| Observatory, Physical, for India, ... ..                    | 60          |
| Officers, Report on the, ... ..                             | 39          |
| Oldham (Dr. T.), President of the Society, ... ..           | 40          |
| " Resignation of office of President, ... ..                | 88          |
| Olpherts (Mr. W. J.), Election of, ... ..                   | 155         |

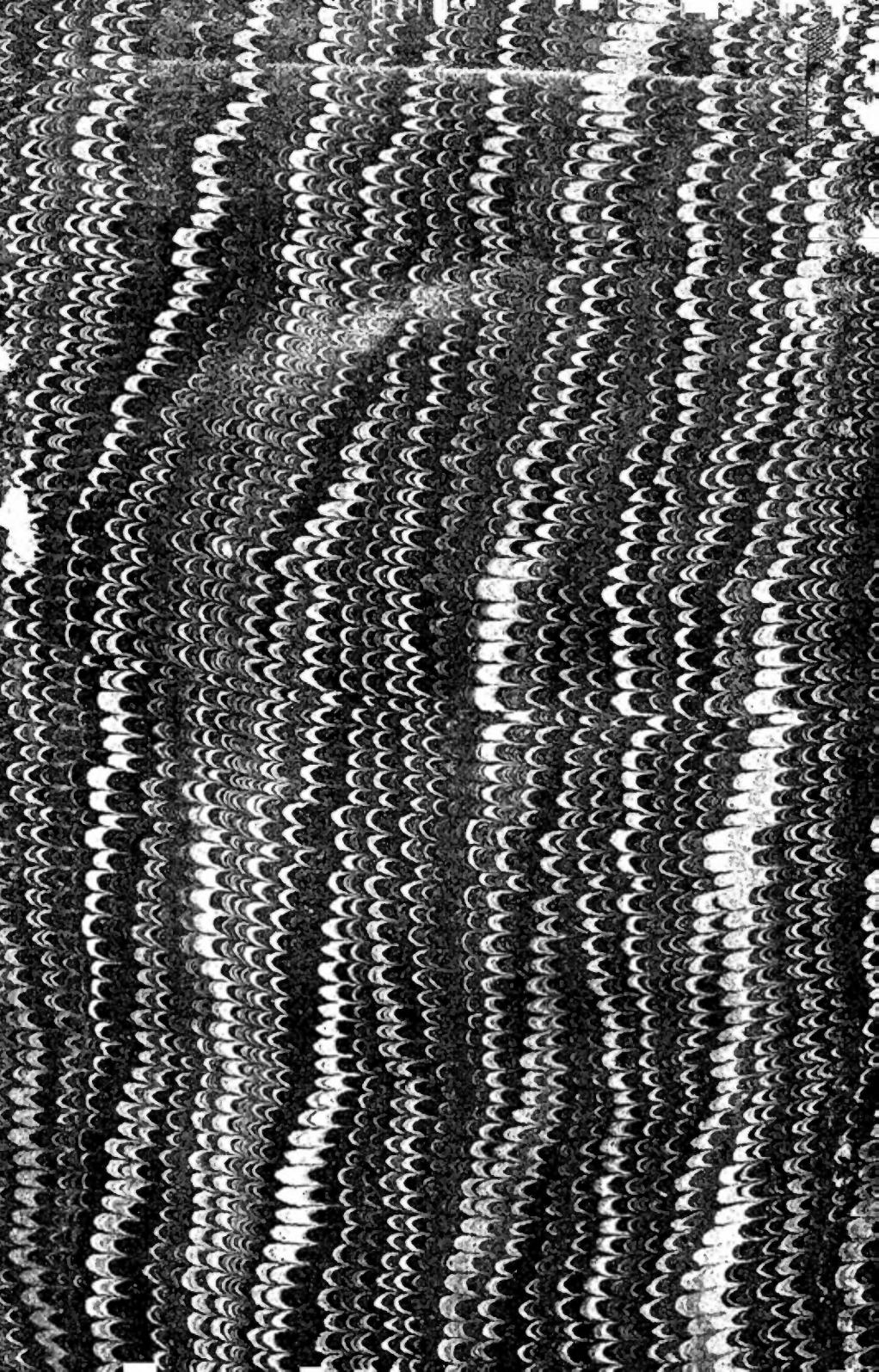
|                                                              | <i>Page</i>               |
|--------------------------------------------------------------|---------------------------|
| Omán, Ibádhi sect of, ... ..                                 | 2                         |
| Paintings, restoration of, ... ..                            | 196                       |
| Palms of Burma, ... ..                                       | 186, 202                  |
| Pánipat Inscriptions, ... ..                                 | 97, 140                   |
| Parker (Mr. J. C.), Election of, ... ..                      | 155                       |
| Partridge (Dr. S. B.), elected a Member of Council, ... ..   | 88                        |
| Passalidæ, Monograph of the, ... ..                          | 112                       |
| Pedler (Mr. A.), Election of, ... ..                         | 155                       |
| " Member of the Physical Science and Liby. Com., ... ..      | 173                       |
| Pegu, History of, ... ..                                     | 82, 88                    |
| Phasmidæ Australian, exhibited by Mr. J. Wood-Mason, ... ..  | 150                       |
| Phayre (Major-General Sir A.), History of Pegu, ... ..       | 82, 88                    |
| Podacanthus Typhon, ... ..                                   | 150                       |
| " viridiroseus, ... ..                                       | 150                       |
| President, Election of, ... ..                               | 40, 88                    |
| Presentations, Receipt of, ... ..                            | 64, 75, 87, 121, 153, 171 |
| Pteropi, Indian, Notes on the, ... ..                        | 147                       |
| Pteropus medius, ... ..                                      | 147                       |
| " nicobaricus, ... ..                                        | 148                       |
| Pycnogonida, New Genus and species of, ... ..                | 110                       |
| Qutb-uddín, Mubárak Sháh, Coin of, ... ..                    | 155                       |
| Qutb-uddín Khán, Mosque of, at Badaón, ... ..                | 199                       |
| Rana Liebigii, ... ..                                        | 111                       |
| Rápri, Inscription from, ... ..                              | 156                       |
| Rawáldhi sect, The, ... ..                                   | 5                         |
| Report, Annual, ... ..                                       | 27                        |
| Reptiles, Andamanese, and Nicobarese, Notes on, ... ..       | 118                       |
| Rhopalorhynchus Krüyeri, ... ..                              | 110                       |
| Rivett-Carnac (Mr. H.), on Stone Monuments, ... ..           | 131                       |
| Rizquallah Khán, of Pánipat, ... ..                          | 97                        |
| Roberts (Rev. J.), Death of, ... ..                          | 28                        |
| Ross (Lieut.-Col.), on the Ibádhi sect of 'Omán, ... ..      | 2                         |
| Rustam Khán Dak'hiní, of Murádábád, ... ..                   | 99                        |
| Saif-uddín Abul Muzaffár, Firúz Sháh (II), of Bengal, ... .. | 171                       |
| Salt-lake, at Lonar (W. Berar), ... ..                       | 69                        |
| Sambhal, Bábar's Mosque at, ... ..                           | 98                        |
| Samogar, near Ágrah, Battle of, ... ..                       | 12                        |
| Sarabala Inscription, Hariyáná district, ... ..              | 102                       |
| Sátgám (W. Berar), Temples at, ... ..                        | 71                        |
| Saxton (Col. G. H.), Withdrawal of, ... ..                   | 121                       |
| Schlegel (Mr. F.), Election of, ... ..                       | 1                         |

|                                                                                            | <i>Page</i> |
|--------------------------------------------------------------------------------------------|-------------|
| Secretaries, Election of, ... ..                                                           | 40          |
| Sefatiyeh sect, The, ... ..                                                                | 5           |
| Sháh Jahán, Inscriptions of from Amrohah and Sambhal, ... ..                               | 90          |
| Sháh Jalál, Tomb of, at Silhat, ... ..                                                     | 90          |
| Shaikh Mína, Inscription on the tomb of, at Lakhnau, ... ..                                | 11          |
| Sherpur Bivarana, ... ..                                                                   | 64          |
| Shiah sect, The, ... ..                                                                    | 5           |
| Sikandar Sháh, Abul Mújáhid, king of Bengal, ... ..                                        | 20          |
| Sikandar Sháh, Inscription of, at Dihli, ... ..                                            | 158         |
| Sinha Bahádúr (Kumar Girischandra), Election of, ... ..                                    | 155         |
| Sirpúr (W. Berar), Temple at, ... ..                                                       | 67          |
| Siva Tál, Mathurá, Inscription from, ... ..                                                | 16          |
| Smart (Mr. R. B.), Withdrawal of, ... ..                                                   | 195         |
| Smith (Mr. W. McL.), Elected Member of the Library and Physical Science Committees, ... .. | 88          |
| Snake, Double-headed, ... ..                                                               | 28          |
| Sonpat, Inscriptions from, ... ..                                                          | 94          |
| Spankie (Hon. R.), Withdrawal of, ... ..                                                   | 195         |
| Stoliezka (Dr. F.), Contributions of, ... ..                                               | 55, 75      |
| "    on Andamanese and Nicobarese Reptiles, ... ..                                         | 118         |
| "    on Indian Land Shells, ... ..                                                         | 119         |
| "    on the Passalidæ, ... ..                                                              | 112         |
| "    Resignation of Nat. Hist. Secretaryship, ... ..                                       | 121         |
| "    Trustee for the Society, ... ..                                                       | 29          |
| Stone Monuments in Chutia Nágpur, ... ..                                                   | 180         |
| Stubbs (Major F. W.), on Shaikh Mína inscription, ... ..                                   | 11          |
| Sunnárgáon, Photographs of, ... ..                                                         | 93          |
| Sykes (Col. W. H.), Death of, ... ..                                                       | 28, 47      |
| Sylvia caligata, ... ..                                                                    | 147         |
| "    Rama, ... ..                                                                          | 147         |
| Táj-uddín Ahmad, of Mahobá, ... ..                                                         | 157         |
| Tasmania, Meteorological Observations of, ... ..                                           | 64          |
| Theobald (Mr. W.), on Type specimens of Batrachia, ... ..                                  | 110         |
| "    on Unionidæ, ... ..                                                                   | 162         |
| Tolbort (Mr. T. W. H.), on the Portuguese in India, ... ..                                 | 150, 161    |
| Tonnerre (Dr. C. F.), Withdrawal of, ... ..                                                | 88          |
| Tribeni, Mosque at, ... ..                                                                 | 118         |
| Tropidoderus Childreni, ... ..                                                             | 150         |
| Tughril, 'Izz-uddín Abul Fath, Governor of Lakhnauti, ... ..                               | 20          |
| Turnbull (Mr. R.), Election of, ... ..                                                     | 87          |
| Urmston (Mr. H. B.), Election of, ... ..                                                   | 94          |

|                                                                                | <i>Page</i> |
|--------------------------------------------------------------------------------|-------------|
| Van Cutsem (Mr. E.), Withdrawal of, ... ..                                     | 156         |
| Venus, Transit of, ... ..                                                      | 59          |
| Vespertilio, harpia, ... ..                                                    | 107         |
| " longipes, ... ..                                                             | 110         |
| " macropus, ... ..                                                             | 110         |
| " murinoides, ... ..                                                           | 148         |
| " murinus, ... ..                                                              | 148         |
| " new species of, from N. W. Himalaya, ... ..                                  | 148         |
| " suillus, ... ..                                                              | 107         |
| Vice-Presidents, Election of, ... ..                                           | 58          |
| Waagen (Dr.) Palaeontological discoveries of, ... ..                           | 40          |
| Wace (Lieut. R.), Election of, ... ..                                          | 1           |
| Waldie (Dr. D.), on filtration of Húgli Water, during the rainy season, ... .. | 175         |
| Weather Bulletins, from Washington, U. S., ... ..                              | 78          |
| Weather Charts, ditto ditto, ... ..                                            | 64          |
| West Berar, Hemadpanti Temples in, ... ..                                      | 66          |
| Westland (Mr. J.), Member of Council, ... ..                                   | 121         |
| White (Mr. E.), Election of, ... ..                                            | 87          |
| Williams (Mr. H. C.), Election of, ... ..                                      | 1           |
| Williams (Mr. G. R. C.), Election of, ... ..                                   | 94          |
| Wise (Dr. J.), Inscriptions from Silhat, ... ..                                | 90          |
| Wolf-reared children, Notes on, ... ..                                         | 128         |
| Wood, dug out at Baddibati, near Húgli, ... ..                                 | 78          |
| Wood-Mason, (Mr. J.), appointed Natural History Secretary, ... ..              | 121         |
| " Australian Phasmidæ exhibited by, ... ..                                     | 150         |
| " notes on species of Bacillus, ... ..                                         | 148         |
| " specimen of Carcinus mænas, exhibited by, ... ..                             | 172         |
| " on a new genus and species of Land-crabs from the Nicobar Islands, ... ..    | 161         |
| " on new genus and species of Pycnogonida, ... ..                              | 110         |
| Woodrow (Mr. H.), Withdrawal of, ... ..                                        | 172         |
| Woodthorpe (Lieut. R. G.), Election of, ... ..                                 | 155         |
| Yárkand Mission, Suggestions for the, ... ..                                   | 122         |
| Yemen tribes, the, embrace Ibádhi religion, ... ..                             | 4           |
| Yúsuf Sháh, Shams-uddín Abul Muzaffar, king of Bengal, ... ..                  | 21          |
| Zeller (Dr. G.), on Burmese Algæ, ... ..                                       | 119         |
| Zoological classification, Kaup's system, ... ..                               | 113         |
| Zoological nomenclature, Harting's system, ... ..                              | 114         |







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